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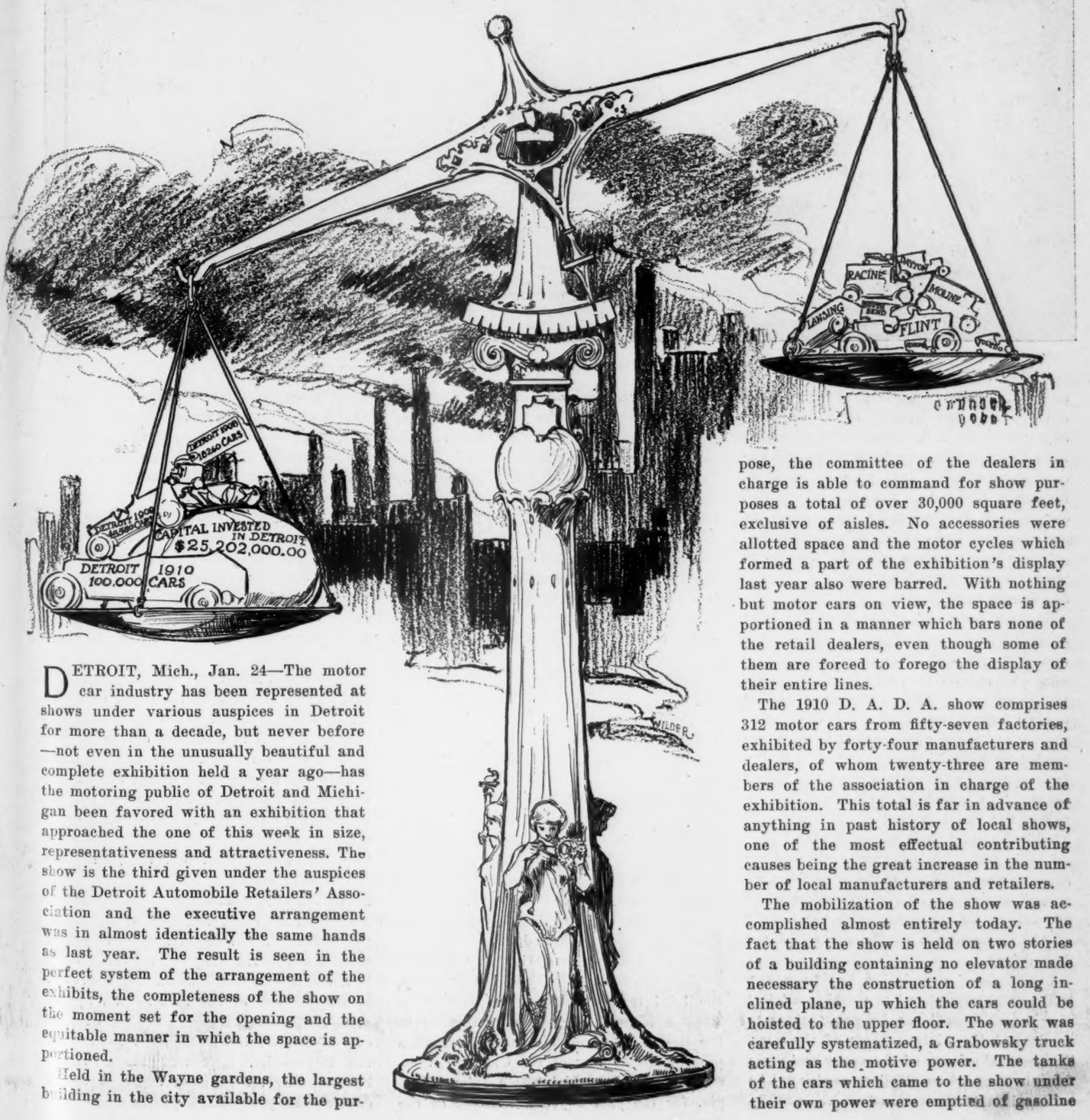
MOTOR AGE

New Cars Feature of the Detroit Show

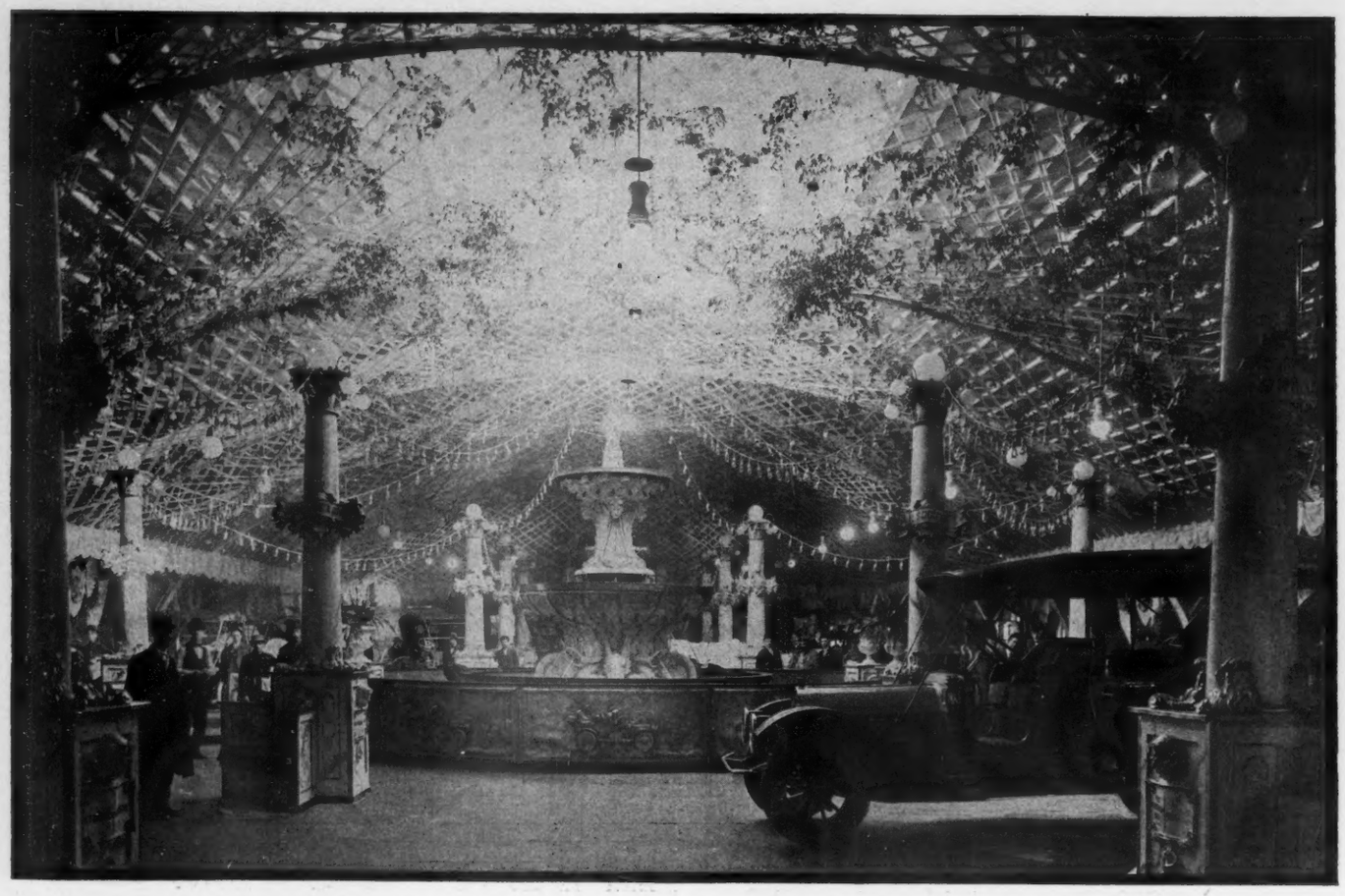


DETROIT, Mich., Jan. 24—The motor car industry has been represented at shows under various auspices in Detroit for more than a decade, but never before—not even in the unusually beautiful and complete exhibition held a year ago—has the motoring public of Detroit and Michigan been favored with an exhibition that approached the one of this week in size, representativeness and attractiveness. The show is the third given under the auspices of the Detroit Automobile Retailers' Association and the executive arrangement was in almost identically the same hands as last year. The result is seen in the perfect system of the arrangement of the exhibits, the completeness of the show on the moment set for the opening and the equitable manner in which the space is apportioned.

Held in the Wayne gardens, the largest building in the city available for the purpose, the committee of the dealers in charge is able to command for show purposes a total of over 30,000 square feet, exclusive of aisles. No accessories were allotted space and the motor cycles which formed a part of the exhibition's display last year also were barred. With nothing but motor cars on view, the space is apportioned in a manner which bars none of the retail dealers, even though some of them are forced to forego the display of their entire lines.

The 1910 D. A. D. A. show comprises 312 motor cars from fifty-seven factories, exhibited by forty-four manufacturers and dealers, of whom twenty-three are members of the association in charge of the exhibition. This total is far in advance of anything in past history of local shows, one of the most effectual contributing causes being the great increase in the number of local manufacturers and retailers.

The mobilization of the show was accomplished almost entirely today. The fact that the show is held on two stories of a building containing no elevator made necessary the construction of a long inclined plane, up which the cars could be hoisted to the upper floor. The work was carefully systematized, a Grabowsky truck acting as the motive power. The tanks of the cars which came to the show under their own power were emptied of gasoline



CENTRAL FOUNTAIN AND LATTICE CEILING IN DETROIT SHOW AT WAYNE GARDENS

and oil, over 160 gallons of fuel being dumped into the Detroit river, which is adjacent to the hall. Extra-wide entrances have been installed on both floors and the cars were wheeled into position with remarkable dispatch. The decorators and electricians finished their work early in the afternoon and at 6 o'clock a brigade of cleaners swept up the rubbish. The doors were opened promptly at 7:30.

Big Crowd First Night

The publicity end of the show has been attended to in very thorough style and a record crowd was looked for on opening night, though nothing like what the evening developed. The crowd stormed the doors of the show, more than 12,000 persons—the largest number that has ever attended an exhibition of motor cars in Detroit—paying admission within the first 2 hours. The crowd jammed the aisles, invaded the exhibits and simply ran riot. The dealers and their salesmen were taken off their feet. No systematic view of the show was possible under the conditions, although every one of the spectators could not fail to be impressed with the beauty of the arrangement of the show and the decorations.

The dealers' association has to a certain extent reproduced the design of last year which caused the Detroit feature to be dubbed the Picture Show of the year. The general scheme of the upper and main floor is that of an Italian garden. The ceiling is a latticework of white bunting, in which are festooned immense quantities of southern smilax and thousands of paper roses. From interstices in the foliage gleam many-colored electric lights. In the center is a fountain, fancifully sculptured with figures appropriate to the occasion. The waters at the foot of the fountain are filled with goldfish and the reservoir is surrounded by a circular seat, deeply upholstered, which offers an inviting resting place. The pillars of the hall, as well as the entrance to the stairway which connect the two floors of the show, are embellished by hollow panels of stained glass, lighted from within. On the walls are displayed the white and gold of the D. A. D. A. and the escutcheon of the association done in staff. The same general plan prevails in the decorations of the lower floor.

Commercial Exhibit Made

The west side of the lower floor is given up to the display of commercial vehicles, the most prominent being the Rapid which is displayed almost in detail the same line which was on view at the New York show. Immediately opposite is the white Stoddard-Dayton torpedo and other Stoddard models. Not far away is the Chalmers-Detroit display, made by Grant Brothers, the local representatives. The revolving Thomas chassis, a prominent feature of the New York show, is almost adjacent, a part of the display of the Gillespie Auto-sales Co., under which name John Gillespie, for the past 2 years manager of the local show, has made his debut in the ranks of local dealers. The Herreshoff, Cadillac, Cartercar, Elmore and a considerable number of the newer cars are on view in this portion of the hall.

The upper floor is devoted largely to the older dealers of the association. The Ford has a large space, in which are shown the chassis, on view at the Palace show in New York, and several models of the firm's model T cars. The Cunningham Auto Co., which had originally reserved space for the E-M-F, Flanders and Studebaker lines, kept the space, though dropping the last-mentioned car from its list, and is thus enabled to show not only the white and gold show cars of the Flanders and E-M-F but also several of the regular models of both types. The Buick's local branch has a complete display, embodying several models not seen in the local salesrooms up to this time. The exhibit came virtually complete from the eastern circuit. The Brush Runabout Co. shows several varieties of cars.

Light Runabouts Grouped

Gilmour & Fear, local distributors for the Mitchell and the Krit, enjoy excellent facilities for the display of their cars, in a booth near the head of the stairway. The upper end of the hall has an appropriate, if unintentional grouping of several of the Detroit-made light runabouts, the Hupmobile, Krit and Paige-Detroit booths being all virtually adjacent which enables the prospective purchasers to se-

General View of Italian Garden Scheme of Decoration at the Detroit Show

cure an excellent line of comparison without the necessity for traveling about the show.

Exceptional facilities are enjoyed by the Maxwell-Briscoe-McLeod Co., now a factory branch of the Maxwell, and the J. H. Brady Auto Co., local distributor of the Hudson and Peerless. These two firms share the stage at the lower end of the hall and the two exhibits, flanked by statuary and elevated several feet above the main floor, are conspicuous from all parts of the hall.

Adjacent to the stage is the exhibit of the Bemb Auto Sales Co. which recently has been formed to handle the Palmer-Singer car in Detroit and Michigan. Prominent in its display is one of the torpedo models which formed so striking a portion of the show for the visitors to whom the type was a distinct novelty, none of the local manufacturers having as yet entered into its construction.

A novel feature is the display in the main aisle of the newly-organized Lozier-Detroit Co. This firm was unable to secure a regular space but secured the consent of the management of the show to the narrowing of several adjacent exhibits in order to make room for the stationing of three big Lozier cars, made at the Plattsburg factory.

Wise Lot of Onlookers

The crowd tonight included as usual a large percentage of factory employes and attaches and chauffeurs. It was pronounced by some of the show men who have been following up the circuit of the eastern shows, the wisest crowd ever gathered inside a building in which motor cars were on exhibition. Formulæ for horsepower, heat-treatment of steels, adjustment of timing apparatus and similar matters of a sort with which the average salesman is not always acquainted, formed topics for discussion and more often than not the salesman found himself in beyond his depth.

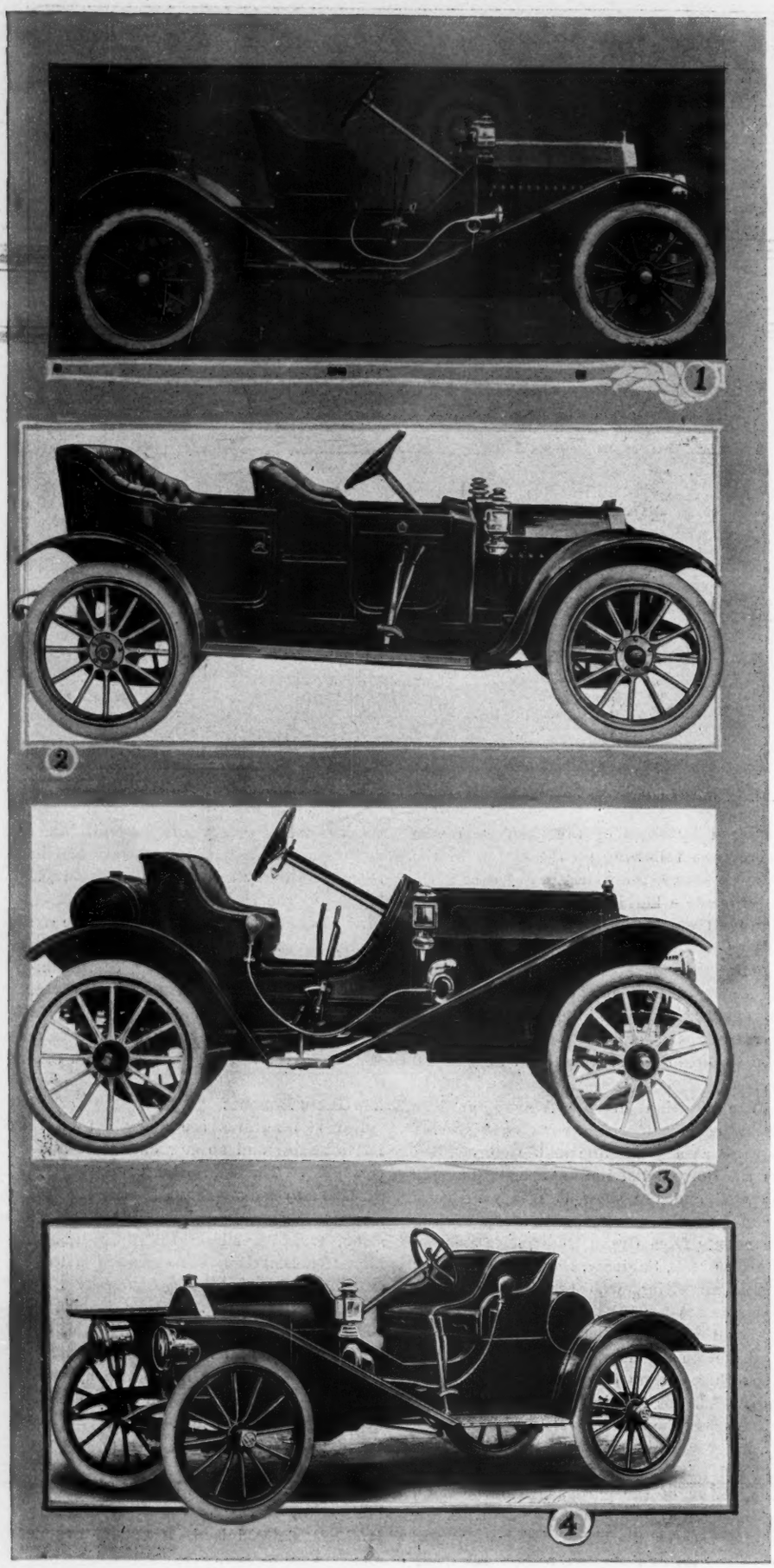
The location of the Wayne gardens comes as near the ideal for the purpose of a show as any possible in the city. Most of the Detroit distributors are state agents as well and the show is this year more than ever the occasion for the gathering of agents from Grand Rapids, Kalamazoo, Battle Creek, Saginaw, Bay City and other Michigan cities, who are here to place their orders for 1910. The show is directly across the street from the Michigan Central station and is only a short walk from the other centers of passenger traffic. It is possible for the dealers to arrive in the city, cross the street to the Wayne hotel and never step out of doors to make a thorough investigation of the show. The connection of the gardens with the hotel also permits of unusual cafe facilities, the dining room of the Wayne being connected with the upper floor of the show by a viaduct which permits of access without leaving the limits of the exhibition. Front street, which with the Detroit river forms the lateral boundary of the building, is available for the parking of cars and has been filled every afternoon and evening.

But for the fact that the show is necessarily split into two parts by the two floors, the arrangement would be ideal. As it is, the one great defect of the show is the fact that it has been so radically cut in half, this feature being doubly emphasized by the necessity for two orchestras and double equipment throughout in other lines.

The Press Banquet

But two fixtures are attendant on the Detroit show and no new ones were added this year. The exhibition's opening was preceded by a banquet, tendered the local and visiting newspaper men by the association, at which Mayor Philip Breitmeyer, himself a Detroit motor car manufacturer, presided, addresses being made by Show Manager Gillespie, Secretary Robert K. Davis, Paul Hale Bruske, William Orr, Joseph S. Smith, W. R. Wreford and Ross I. Schram. Thursday night was, as usual, society night, the admission being doubled in order to make it possible for at least one evening crowd to enjoy a privilege of an inspection of the show without experiencing a jam similar to that of the opening night. On Friday or Saturday night the D. A. D. A. will hold its annual banquet and jubilation, the date and place not having been settled upon as yet.

A resume of the list of exhibits revealed the somewhat startling fact that of the



1—Warren-Detroit Three-Passenger Roadster
2—Detroit-Dearborn Torpedo Touring Car
3—The Little Paige-Detroit Runabout
4—The Saucy Krit Runabout

fifty-one different factories represented, twenty-four were making their first appearance at a Detroit show. While a large number of these cars are the products of recently-organized Detroit factories, more yet, such as the Palmer-Singer, Stearns, Haynes and Lozier, are the result of the expansion of the local and state retain interests which have taken the agencies for cars well known outside Michigan, but which have never heretofore secured a local foothold.

Fourteen New Cars

Among the interesting exhibits which are now being shown for the first time, fourteen cars make their debuts at the present show. These are the Abbott-Detroit, Anhut six, Detroit-Dearborn, De Tamble, Krit, Michigan steam motor truck, Parry, Paige-Detroit, Templeton-Dubrie, Van Dyke, Warren-Detroit, Welch-Detroit and Whiting.

The Parry cars manufactured by the Parry Auto Co., Indianapolis, are built upon a single chassis which may be equipped with a five-passenger touring car body, or a roadster body with a toy tonneau, a surrey seat, a rumble seat or a double bucket seat. The lines of these cars are racy and the appointments refined; and the design is comparatively simple with the parts all accessibly arranged. and conventional. The chief characteristics of the Parry cars are a four-cylinder, valve-in-the-head motor, a selective gearset, a driveshaft inclosed in a torsion tube, a semi-floating rear axle, 116-inch wheelbase, 34 by 3½-inch tires on the touring car, and an option og 32 or 34 by 3½-inch on the runabout models. The Parry motor has many commendable features. The cylinders are cast in pairs with the water-jackets cast integral and of large area, and are so designed that a thorough circulation is maintained around the valve chambers. Both intake and exhaust valves are in the heads and are operated by means of long push rods and rocker arms from a single camshaft contained within the crankchamber. The bore and stroke of these cylinders are 4¼ and 4½ inches respectively, the cylinders, pistons and

DETROIT SHOW EXHIBITORS

W. F. V. Neumann Co.—Stoddard-Dayton and Rauch-Lang electric
Detroit-Dearborn Co.—Dearborn-Detroit
Anhut-Robinson Auto Sales Co.—Anhut
Michigan Motor Sales Co.—Oakland and Welch of Pontiac
Auto Commercial Co.—Grabowsky power and Stanley
Rapid Motor Vehicle Co.—Rapid truck
Van Dyke Construction Co.—Van Dyke
Michigan Steam Motor Co.—Michigan truck
Standard Auto Co.—Packard
Postal & Doherty Co.—White
Flint Wagon Works—Whiting
Neil-Kitchell Motor Sales Co.—Parry and DeTamble
Herreshoff Motor Co.—Herreshoff
P. W. Schulte Garage Co.—Kissel
Fee-Bock Auto Co.—Overland, Elmore and Woods electric
J. B. McIntosh Co.—Lambert
Cadillac Motor Car Co.—Cadillac
Cartercar Co.—Cartercar
Anderson Carriage Co.—Detroit electric
Broadway Auto Co.—Haynes
Harper-Aldrich Auto Co.—Demotcar
W. A. Patterson Auto Co.—Patterson
Security Auto Co.—Everitt
Gillespie Auto Sales Co.—Thomas and Reo

piston rings are ground, all gears are encased, and the rating is 32 horsepower.

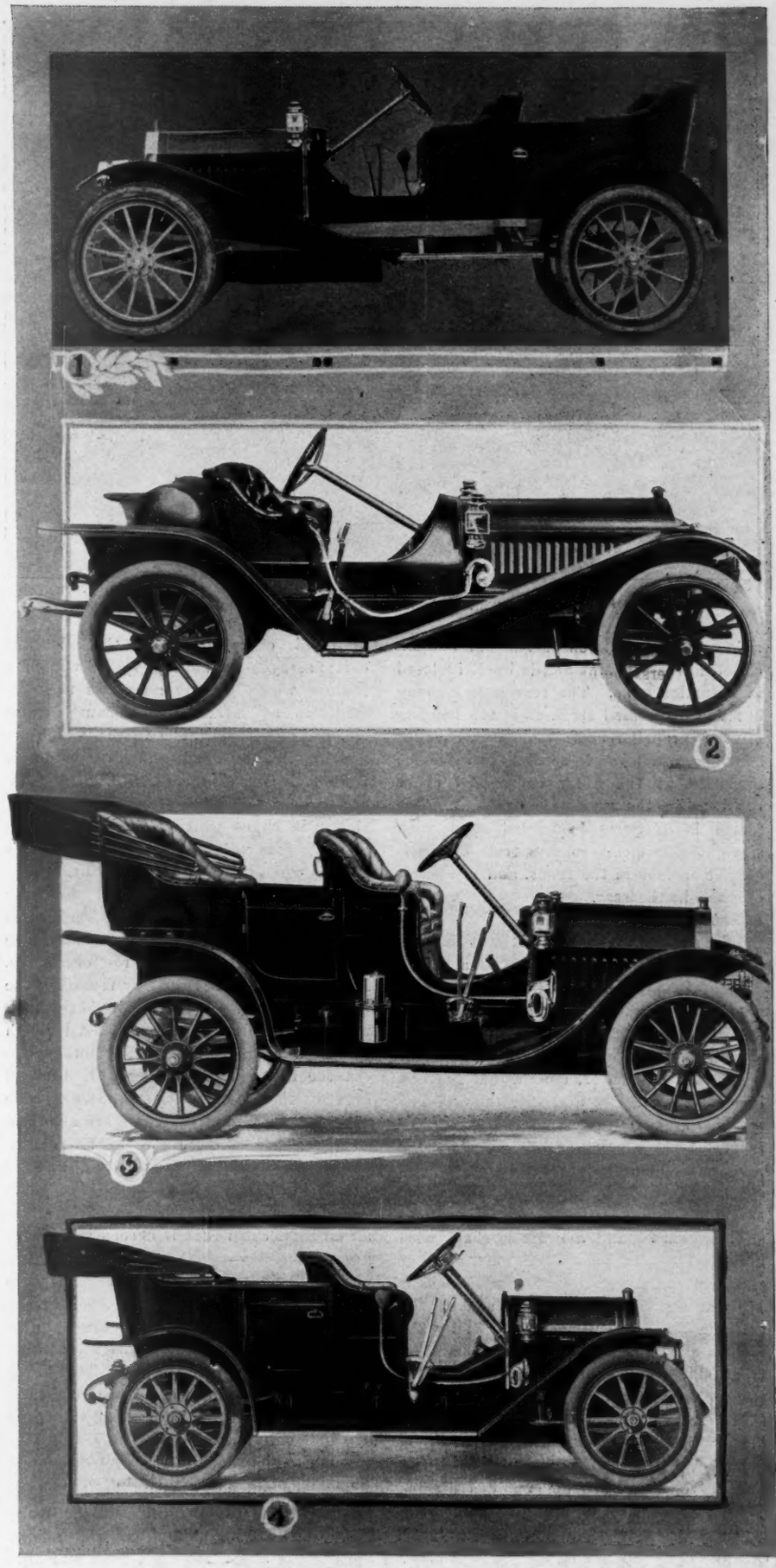
Lubrication of the motor is by means of a circulating splash system in which a constant oil level is maintained in the crankcase, by means of a gear pump driven off the camshaft. The lower half of the aluminum crankcase is divided into two horizontal compartments. In the upper compartment there are four splash chambers in which the conecting rods dip. These compartments are made so as to hold a predetermined amount of oil on any grade to insure perfect lubrication. When the oil level in these compartments reaches a certain height, the lubricant overflows and is drained back into the lower portion of the crankcase where it is strained and then forced up through a sight on the dash and back into the splash chambers. The crankshaft is supported by bearing caps which are bolted to the upper half of the case and four heavy arms of channel section support the motor upon a subframe, to which the gearset is also attached.

Dual Ignition Is Favored

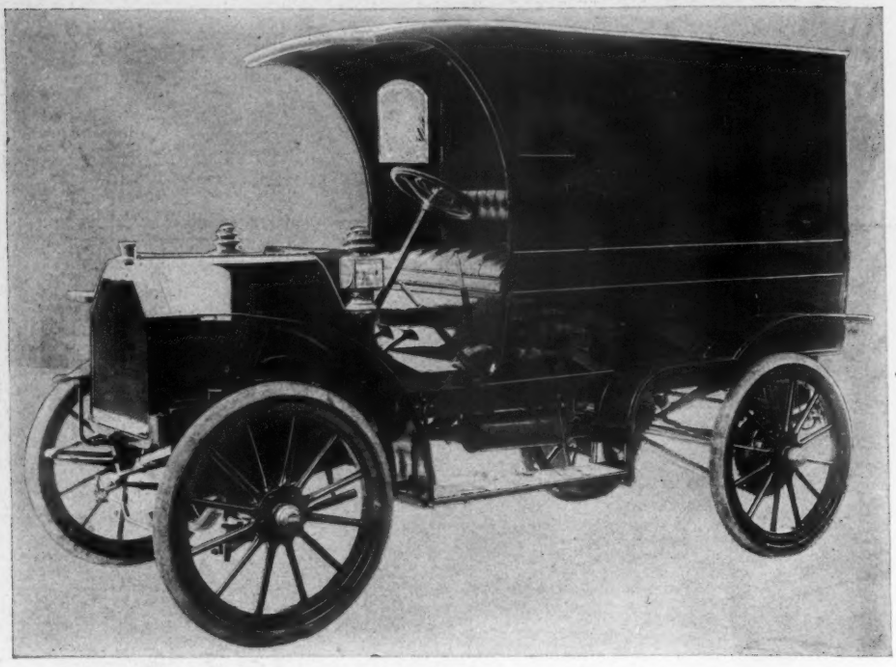
Ignition is by means of a dual jump spark system with the current furnished by a high-tension magneto and dry cells. Both the magneto and the centrifugal water pump are driven by means of shafts from the same gear, which is inclosed with the timing gears, and flexible couplings are provided to allow for any possible misalignment. A leather-faced cone clutch with five flat springs beneath the leather to bring about smooth engagement transmits the power from the motor to the gearset. This clutch is supported on a spindle which is bolted directly to the crankshaft, and a ball thrust bearing is used on the end of the clutch spring. A large universal joint is provided between the clutch and the transmission to allow for any slight misalignment of the parts due to the contortions of the frame. The gearset which gives three forward speeds is located amidships, is accessible by raising the front floor boards, and by placing the two shafts in the same vertical plane an almost straight-line drive is obtained to the rear

DETROIT SHOW EXHIBITORS.

Winton Motor Carriage Co.—Winton
Gilmour & Fear Auto Co.—Mitchell and Krit
Grant Brothers—Chalmers-Detroit and American Simplex
Palmer Auto Co.—Stearns
Seidler & Miner Auto Co.—Jackson and Babcock electric
Olds Motor Works—Oldsmobile
Ford Motor Car Co.—Ford
Brush Runabout Co.—Brush
Regal Motor Sales Co—Regal
Maxwell-Briscoe-McLeod Co.—Maxwell
J. H. Brady Automobile Co.—Peerless, Hudson, Pope-Hartford
Bemb Auto Sales Co.—Palmer-Singer
Cunningham Auto Co.—E-M-F, Flanders and Studebaker
J. P. Schneider—Pierce-Arrow, Stevens-Duryea and Baker electric
Detroit Motor Sales Co.—Keystone, Paige-Detroit and Warren-Detroit
Buick Motor Car Co.—Buick
R. W. Keeler—Hupmobile
Lozier-Detroit Sales Co.—Lozier
Metz Plan Co.—Metz
Templeton-Dubrie Auto Co. — Templeton-Dubrie
Montgomery Sales Co.—American
Welch-Detroit Auto Co.—Welch-Detroit



1—Warren-Detroit Five-Passenger Touring Car
2—Anhut-Six Roadster, Racey Type
3—The Whiting Five-Passenger Touring Car
4—The Five-Passenger Abbott-Detroit



LIGHT COMMERCIAL VEHICLE MADE BY BAILEY COMPANY

axle. The propellershaft has but one inclosed universal joint and is itself inclosed in a torsion tube. The rear axle housing is made of pressed steel, as is the housing of the propellershaft, and Hyatt roller bearings, which run in special steel sleeves, are used at the outer ends. All other bearings in the rear axle are ball. The frame is of pressed channel steel with straight side members, and rests on semi-elliptic springs in the front, and full scroll elliptics in the rear.

Anhut Six on View

The Anhut six, which is built by the Anhut Motor Cao Co., Detroit, is a highly standardized product with a four-passenger, toy-tonneau and two or three-passenger roadster bodies fitted on the same chassis. The power plant is of the unit type, with the motor, clutch, and gearbox in a single housing, and the whole is suspended from the side members of the frame at three points. The motor, which is of the four-cycle water-cooled type, has six cylinders and its power is transmitted through a multiple-disk clutch, a selective sliding gearset and a propellorshaft with universal joints to a live rear axle of standard characteristics. The wheelbase is 110 inches; the road wheels are of the artillery pattern, equipped with 34 by 3½ inch tires, there are semi-elliptic springs front and rear with thin wide plates to assure easy riding, and a channel section chassis frame is the platform on which the equipment rests. The brakes, in order that they will compare favorably with the rest of the plan, are of generous dimensions and of the external and internal type on the rear wheel drums. In these cars the cylinders are of the vertical type, cast in pairs. The waterjackets are extremely long and of large area, and there is but one intake and one exhaust port to ecah pair of cylinders, for the inlet and exit passages of both gas and water; a feature which greatly simplifies the construction of intake and exhaust, water and gas manifolds. The valves, which are are all in the head and in completely waterjacketed chambers, are located directly over the pistons, and they are inclosed in cages which may be easily removed; thus allowing the valves to be ground when apart from the motor.

Accessibility has been very carefully considered and in the construction of this motor, it being possible to quickly remove the entire intake side of the crankcase. By loosening ten nuts and by removing the camshaft bearings the entire camshaft, the cams, gears, etc., are removed through this opening in the side of the motor without the removal of the radiator, flywheel or any other fixed parts of the car. Side openings for quick inspection are also provided on the exhaust side of the crankcase. The timer, magneto, water and oil pumps are driven through a nest of gears which are at all times immersed in oil in an oil-tight case; thus it is seen that every precaution has been taken to secure a clean, oil-tight motor. Ignition is jump spark, and a centrifugal pump, belt-driven fan and vertical-tube radiator are features of the cooling system. Lubrication is of the circulating type, a constant level being maintained within the splash compartments of the crankchamber by a gear driven gear pump.

Warren-Detroit Features

The Warren-Detroit cars built by the Warren-Detroit Motor Car Co. are made in two body types, a demi-tonneau or light touring car and a roadster, both of which are fitted to the same chassis. The characteristics of this chassis are a four-cylinder, water-cooled en bloc motor, a leather-faced cone clutch, a selective gearset located amidships, a semi-floating rear axle with a driveshaft contained in a torsion tube and 32 by 3½-inch tires on the roadster and 34 by 3½-inch tires on the demi-tonneau. The cylinders of this motor are of the vertical L type, have a bore and stroke of 4 and 4½ inches respectively, and are rated at 26 horsepower. The inlet and exhaust manifolds, separate castings, are held in place in a conventional manner. Waterjackets are all cast integral with the cylinders, and the valves are all on one side, mechanically operated from a single camshaft within the crankchamber. The crankcase of the motor is of cast aluminum and divided horizontally so that the crankshaft is supported in the upper half and held into place by caps containing liberal bearings of parsons white bronze. The lower half of the crankcase may be readily removed for the inspection or adjustment of the connecting rods and when in place forms an oil pan for the constant level splash lubrication. This is a circulating system in which the level is maintained constant by means of a piston oil pump.

The camshaft, of the three-bearing type, is ground to size on the shaft and square valve tappets are used. Ignition is by means of a dual jump spark system with a Volta magneto and dry cells as sources of current. A single-unit induction coil is used in connection with this system, and the wires about the motor are supported in a hard rubber case. In the cooling system, the principal features are a large, vertical-tube radiator, a six-blade fan and a gear-driven, centrifugal pump. Transmission from the motor is by means of a leather-faced cone clutch of the conventional type with slip springs under the leather to insure easy engagement. This clutch consists of an aluminum cone mounted with parsons white brass bushings on the spindle of the crankshaft. The clutch collar is of phospher bronze, working on hardened steel, and two universal joints. Hardened steel sliding blocks which are drop-forged and heat-treated, are used between the clutch and transmissionshaft to allow for any misalignment that might take place through a twisting of the frame on exceptionally rough roads. The gearset, located amidships, rests on a subframe with the motor and gives three forward speeds. All gears are of special gear steel and hardened; shafts are of high-carbon steel and accurately ground. The keys of the sliding gearshaft are integral and an absolute interlocking device is provided to hold the gears properly in mesh. The frame of the car is of pressed steel channel section and arched over the rear wheels to allow for sufficient spring action and axle clearance, and it rests on semi-elliptic springs in the front and three-quarter-elliptics in the rear. Control of the car is conventional with the clutch and service brake operated by foot, hand levers at the right of the driver's seat for the operation

of the gearset and emergency brakes, ignition and throttle levers are placed over the steering wheel, and a foot accelerator is provided to assist the driver in controlling the car.

DeTamble Roadster

Every effort of the DeTamble Motor Co., Anderson, Ind., will be centered this year upon the production of its DeTamble roadster. This is a moderately low-priced car which is shaft-driven, has a two-cylinder 16-horsepower horizontal water-cooled motor, a two-speed planetary gearset, a semi-floating rear axle, 30 by 3-inch tires, and a 90-inch wheelbase. The power plant of this car is located in the forward end of the chassis so that the motor comes under the hood in a conventional manner. The cylinders are of the L type with integral waterjackets of large dimensions, and are cooled by thermo-syphon circulation. These cylinders are opposed and offset to bring them in line with the throws of the crankshaft; they have a bore and stroke of 4¼ and 4 inches respectively; and the brackets by which the motor is suspended directly from the side members of the frame are attached to the cylinder heads. Cylinders are all lapped to size, and pistons, piston rings, piston pins, camshafts, and crankshafts are all ground to a fit. Connecting rods and crankshaft bearings are hand-scraped and divided on the center line with five brass liners for taking up wear. A Schebler carbureter is fitted and the fuel feed is by gravity. Ignition is by means of a jump spark dual system with a high-tension magneto and dry cells as sources of current.

In the thermo-syphon cooling system, the water enters the cylinders from the lower side of the head and passes out at the upper sides of the heads and back to the square-tube type of radiator through large hose connections. Lubrication is by means of a mechanical oiler over the cylinder on the left side, which has four feeds leading to the cylinders and main bearings. The magneto is conveniently located on the top of the crankcase and driven off the camshaft gear. Valves being on the top side of the cylinder may be quite readily reached; and all cams are operated through push rods from a single camshaft contained within the crankchamber.

Planetary Gearset Is Used

The planetary gearset is mounted on a pan which is cast integral with the crankcase of the motor, thus making a unit of the motor and gearset, and the rear end of this pan is mounted on a crossmember of the frame to bring about a three-point suspension of the power plant. One notable feature of the DeTamble motor is the use of individual mufflers for each cylinder located on either side of the car inside of the frame, a feature which does much toward elimination of back pressure in the exhaust pipes and increasing the power of the motor. Transmission from the gearset to the rear axle is by means of a shaft

VAN DYKE COMMERCIAL WAGON SHOWN IN DETROIT

with one universal joint just behind the gearset which is inclosed in a torsion tube. Annular ball bearings are fitted at both ends of this tube, and grease cups are provided on all outboard bearings to facilitate lubrication. The rear axle itself is equipped with Hyatt roller bearings, and long radius rods are provided which extend from the sides of the rear axle housing to the forward end of the torsion tube. The frame is of pressed steel construction, and resting on elliptic springs in front and rear. Internal expanding service brakes act upon the rear wheel drums, and the reverse may be used in case of emergency.

Enclosed Delivery Wagon

The Bailey, manufactured by the Bailey Motor Car Co., of Detroit, is an enclosed delivery wagon of the full panel type with a load capacity of 1,500 pounds, a load platform 6 feet long by 3 feet 8 inches wide, and 4 feet 10 inches to the top of the interior. The entire length of the vehicle is 11 feet. This car is equipped with a four-cylinder water-cooled vertical motor which is located in front under the hood, has a sliding selective gear transmission giving two forward speeds and reverse in unit with the motor, double side chain-drive 100-inch wheelbase, 36-inch wheels equipped with 2½-inch solid tires and left side control. This is a medium-priced car of simple construction and refined appearance, and should be especially applicable to the use of undertakers, dry goods firms, dealers in provisions, supply houses, florists and the like, where rapid and efficient delivery service is required. The motor is of the valve-in-the-head type with the cylinders cast in pairs with integral waterjackets and a bore and stroke of 4¾ and 4 inches respectively. It is suspended at three points from the pressed steel channel frame and may be quickly demounted therefrom by swinging the radiator out of the way and removing three bolts. Lubrication of the motor is of the self-contained circulating type with the circulation maintained by a gear pump driven off the camshaft. The water circulation of the cooling system is maintained by an eccentric vane pump and cooling is further assisted by a vertical flat-tube radiator and a four-blade belt-driven fan.

Dual System of Ignition

A dual jump spark ignition system is employed with a Remy magneto and dry cells as sources of current, and the spark is controlled by a hand lever on the steering column. The carbureter is of the Schebler float-feed type with the fuel feed by gravity from the supply tank. A multiple-disk clutch with saw-blade steel disks transmits the power from the motor to the selective sliding gear transmission, from whence it is transmitted, through a jackshaft and differential gear, to the rear wheels through double side chains. This allows the use of a solid dead rear axle and the driving strains are transmitted directly to the frame through the radius rods. Full-elliptic springs are employed both in front and in the rear, the front ones measuring 36 by 2 inches, while the rear ones are 42 inches long and 2 inches wide. A service brake is fitted to the jackshaft which expands on a drum 8 inches in diameter and 2 inches wide and taken up by the springs and torque rod the emergency brakes which are of the internal expanding type on the rear wheel drums are 12 inches in diameter by 2 inches wide. Seamless steel tubing 2½ inches in diameter is employed in the front axle; Timken roller bearings are fitted to all the wheels, and hardened bushings are employed in the steering gear and steering knuckles. Plain bronze bearings, babbitt

lined, are used throughout the motor and transmission, with a ball thrust bearing in the clutch.

A newcomer which is exciting much interest among the light commercial vehicles is the Van Dyke delivery wagon manufactured by the Van Dyke Motor Car Co., Detroit. This vehicle may be fitted with a top or stake body, has a load capacity of 1,000 pounds, the length of the platform is 5 feet 8 inches, the width 3 feet, and the total length of the trunk is 120 inches. This is a delivery wagon pure and simple with a wheelbase of 86 inches; the wheels are 32 by 3½ inches, equipped with solid tires, and transmission from the motor is by friction drive and shaft to the bevel gear of the rear axle. The motor is two-cylinder, opposed, water-cooled, with a 4⅜-inch bore and 4-inch stroke, and rated at 12 horsepower. Ignition is jump spark, with the current furnished by a low-tension magneto and an induction coil; a mechanical oiler which is gear-driven furnishes the lubrication, and a gear pump and vertical tube radiator are features of the cooling system.

Cradle Supports Power Plant

The power plant is supported upon a cradle formed by two drop cross-members of the frame, in the forward half, so that its position in the car is beneath the front floor boards and the driver's seat, where it may be readily inspected. The cylinders of the motor are of the L type, and occupy a horizontal position parallel with the side members of the frame. The brackets on which the motor rests are cast integral with the cylinder heads; and the valves are on the upper sides of the cylinders and mechanically operated off a single camshaft contained within the crankchamber. The flywheel which is solid and of large diameter, is about in the center of the frame, and is faced off on the side away from the cylinders to form a friction disk. At the right of the flywheel friction disk, and occupying a position similar to that of the motor on the opposite side of the frame, is the shaft supporting the large friction wheel which is brought to bear upon the friction face of the flywheel. This shaft is itself supported near each end in two Hyatt roller bearings.

Bearings Not Rigidly Connected

These bearings are not rigidly connected by the crossmembers of the frame, but are free to be moved toward and away from the flywheel. Thus the friction wheel is brought into and out of contact with the flywheel. The friction wheel also is free to slide upon the shaft, and by simply moving it back and forth, one is capable of driving the car at any speed up to 16 miles per hour. Transmission from this shaft to the bevel gear rear axle is through a universal block joint and another shaft. The transverse driveshafts of the rear axle are rigidly connected to the differential, otherwise the axle is of the semi-floating type; and the driving and torsion strains are cared for. A channel steel frame is employed which is supported on semi-elliptic springs in front and three-quarter-elliptic springs in the rear; and in addition to a service brake on the driveshaft and internal emergency brakes on the rear wheel hubs, the reverse of the friction disks can be used to a very good advantage in case of necessity.

Abbott-Detroit Motor

The Abbott-Detroit has much to its credit in the way of a family tree. Its designer, John G. Utz, designed the Chalmers 30, was formerly head of the engineering department of the Autocar Co., and before that was with the Olds Motor Works; John B. Phillips, who builds the car, formerly was factory superintendent of the Chalmers-Detroit Motor Co., and A. T. O'Connor, on whose shoulders rests the work of distribution and sales, formerly was assistant sales manager of the Packard Motor Car Co. Previous to that he occupied the same position with the Olds Motor Works, and recently has been in charge of the New York branch of the Packard company. The experience of these men is thoroughly depicted in the car which they have produced. The Abbott-Detroit model A is a five-passenger shaft-driven touring car with a four-cylinder motor of 25.6 horsepower A. L. A. M. rating, 110-inch wheelbase, 34-inch wheels with 3½-inch tires; and the whole creation shows a refinement of detail and scientific proportioning of weight to power.

The motor is of the vertical type, water-cooled, with a 4-inch bore and a 4½-inch stroke. Cylinders are cast in pairs, with the inlet valves in the head, the exhaust valves at the side, and all mechanically operated from a single camshaft with integral cams, which is enclosed within the crankchamber. Lubrication of the motor is by a circulating splash system in which the oil level is automatically maintained in the crankcase and the circulation is produced by a plunger pump driven by an exhaust cam. A centrifugal pump, a vertical-tube radiator, a belt-driven fan with four warped blades and fan spokes in the flywheel, are features of the cooling system. Ignition is by jump spark, dual type, with a low-tension magneto and a storage battery, used in connection with a step-up transformer on the dash under the hood, as sources of current. The clutch is a multiple-disk type with its hardened steel-to-steel disks running in a bath of oil. Transmission to the rear wheels is through a selective sliding gearset equipped with F & S annular ball bearings, a drive shaft with two universal joints, and a full-floating rear axle from which the torque and driving strains are taken up by the springs and torque rods respectively. The springs, which are semi-elliptic in front and three-quarter elliptic in the rear, are long and 2 inches wide. The front axle is an I-beam forging, the frame is pressed steel channel section and the control of the car is of the conventional right-hand type.

A display which is exciting considerable interest is that of the Detroit-Dearborn cars. These are made and shown in two types, a five-passenger torpedo touring and a two-passenger torpedo roadster, both built on the same chassis and having the same general mechanical characteristics. Simplicity and refinement are dominating features of this product and special attention is called to the low center of gravity, the low-hung body and the generous road clearance, which is brought about by the use of large wheels. Other features which are not to be overlooked are the accessibility of the motor and the apparent attention which has been given the various small parts about the car. The appointments have been made with a view to putting the proper thing in each place. Thus the floor boards are covered with aluminum alloy, cocoa matting is fitted into the tonneau and cork covering is applied to the running boards. The car, as a whole, is classy, shows many originalities and the entire design is characteristic of modern engineering practice. The hood is short, full of motor but not crowded; the body is of the straight-line type with equally large doors to both front and rear seats; the steering wheel is large, spark and throttle control levers are conveniently located above the steering wheel, the springs are long, wide and flat, drive from the gearset to the rear axle is practically straight and grease cups are well distributed on all outboard bearings.

Motor a Conventional Four

The motor is a four-cylinder four-cycle vertical type, thermo-syphon water-cooled, and rated at 35 horsepower. The cylinders are cast in pairs with waterjackets and valve chambers integral and the pistons fitted with four rings, three above and one below the piston pin. The crankshaft, which is made of 48 point carbon steel, is 1⅞-inch in diameter and runs on No. 14 alloy bushings which are ground to fit. Nickel steel valves are used with carbon steel stems which are mechanically operated from one-pieced camshafts with integral cams and are inclosed within the crankcase. The camshaft bearings are hardened and ground, the cam gears are bolted to integral flanges on the camshaft and all gears and such moving parts are neatly enclosed, thoroughly lubricated and protected against dust and foreign matter. The upper half of the aluminum crankcase forms the engine base, and is supported at four points on the main frame of the chassis. The crankshaft is held in the upper half of the case and the lower half is removable for inspection and adjustments. The lower half is divided into four compartments in which a constant oil level is maintained by means of the circulating system employed. Splash lubrication is exclusively depended upon. The oil is pumped directly from the lower half of the crankcase to a reserve tank

located between the pairs of cylinder on the left side, from which both compartments of the crankcase are supplied by gravity feed. A sight on the dash is provided to show the driver at all times the quantity of reserve oil in the tank. The clutch, which is of Detroit-Dearborn design, is of the internal expanding shoe type, and very compact and simple in construction. The transmission case, which is located conveniently beneath the floor boards, is suspended by extension arms which are fastened to the rear engine base arms, thus making practically a unit construction. Transmission from the gearset to the semi-floating rear axle is by a shaft inclosed in a torsion tube with radius rods to maintain alignment and take up the driving strains. Two sets of brakes are employed, all acting on the rear wheel drums, which are of a generous width. The rear springs are of the three-quarter elliptic scroll type, the rear axle housing is pressed steel throughout, all shafts and steering knuckles are of vanadium steel, chrome nickel steel is employed in the driving gears, and a pressed steel channel section frame, with a double drop just in front of the dash and just in front of the rear axle, is employed to bring about the low center of gravity.

Three Models of Krits

An exhibit which in a way follows in the footsteps of the Hupmobile and which is exciting as much interest this year as the Hupmobile did last year is that of the Krit motor car. It is made in three models; model A, a two-passenger runabout; model B, a three-passenger runabout, and model C, a four-passenger surrey. Simplicity, accessibility and three-point suspension are the keynotes of its characteristics. The car belongs to the moderate-price class and it is unique for the arrangement and direct control of its parts. It is shaft-driven, has a sliding gear type of transmission giving two speeds, forward and reverse, and a four-cylinder motor rated at 22½ horsepower. The cylinders of the motor are cast in one block, all valves are on the right hand side and mechanically operated from a camshaft inclosed within the crankcase which has integral cams. Inlet and exhaust manifolds are cast separately to simplify the foundry work in the cylinder unit, and they are attached in a conventional manner. The crankcase is of the barrel type, with a liberal hand hole at the bottom for connecting rod adjustment, which is closed with a sheet metal cover. The crankshaft is supported in two large annular ball bearings and the crank pins are exceedingly large for a motor of this size.

Motor and Transmission a Unit

The motor and transmission are a unit, suspended from the frame at one point in front and at two points at the sides opposite the bulge in the crankcase, which indicates the position of the flywheel. The oiling system is self-contained, splash, the circulation being maintained by the flywheel, the oil after overflowing from a predetermined level in the crankchamber drains back to the reservoir which is formed by the flywheel housing; it then is taken up by the flywheel and scooped off near the top into troughs from which it flows back into the crankcase by gravity. Thermo-syphon cooling is employed with characteristic large and simple water connections, a wide adjustable belt-driven fan and a vertical-tube radiator are the principle features. Ignition is by means of a Bosch high-tension magneto with fixed spark. The multiple-disk clutch which is contained in the flywheel consists of comparatively few disks of saw-blade steel and are pressed together by strong springs which act on a cone that communicates its motion through toggle levers to the disks. This combination gives a powerful pressure on the disks, is self-adjusting and may be operated by a very light foot pressure. Small springs made integral with the disks hold them apart when the clutch is disengaged, and a clutch brake is also provided. The two-speed sliding gearset is contained in a compact cone-shaped case bolted to the flywheel housing and forms the end of the power unit. At the rear of the gear box is a universal joint surrounded by a globe joint which connects the propellershaft housing or torsion tube to the frame. On the lower side of the case for the globe joint, are two sockets which fit the ball ends of the struts that extend to the outer ends of the rear axle housing. The rear axle is of the semi-floating type with New Departure ball bearings on the inner ends and Hyatt roller bearings at the wheel ends. The front axle is an I-beam drop forging, the frame is of pressed channel steel supported by two side semi-elliptic springs in front and a long inverted semi-elliptic cross spring in the rear. The rear axle is situated quite a distance behind the rear end of the frame, which greatly increases the riding qualities of the car, and two sets of internal expanding brakes are employed, both acting side by side on the rear wheel drums. The driver's seat and control of the car is on the left hand side of the vehicle.

Templeton-DuBrie, a Delivery Car

The Templeton-DuBrie car, manufactured by the Templeton-DuBrie Car Co., Detroit, is designed especially for grocery men, butchers, bakers, farmers and others who wish to make more rapid progress in the way of making deliveries than could be obtained with horse-drawn vehicles, and who desire a car which at the same time could be temporarily and quickly converted into a pleasure car for evening or Sunday service. This car may be fitted with any type of body, has a load capacity of 1,200 pounds, the platform is 6 feet 6 inches long, 38 inches wide and the total length of the car is 13 feet 8 inches. This is not a delivery wagon but a delivery car. It has 124-inch wheelbase, 56½-inch tread, 30 by 3-inch pneumatic tires, and when stripped of a commercial body is not unlike other cars designed only for pleasure purposes. Its characteristic features are a two-cycle water-cooled motor, a multiple-disk clutch, a planetary transmission in unit with the semi-floating rear axle and the entire elimination of hand control levers other than those regulating the spark and throttle, which are over the steering wheel, control being entirely by pedals practically arranged.

The motor, which is of the vertical type, located in front under the hood, has two cylinders cast en bloc with integral waterjackets and is built on the compound two-cycle principle. The cylinder bore has two diameters, that of the explosion chamber being 4½ inches and that of the compression chamber 6 inches, and the stroke is 4½ inches. The parts of the cylinders, with a 6-inch diameter, form the compression chambers in which the gas is compressed to 70 pounds per square inch when it is admitted to the combustion chamber, where it is held at 40 pounds compression.

Motor Seems Foolproof

This motor is considered absolutely foolproof, inasmuch as there are no cams, gear valves or springs used, nor is there any compression in the crankcase, it simply being inclosed with an oil pan for splash lubrication of the moving parts in the crankchamber. There is an oil reservoir under the floor board at the left side of the frame over the exhaust pipe from which the oil is fed by pressure from the cylinders through a sight feed on the dash, from which it is conducted through four leads to the end bearings of the motor, the cylinders and the crankcase. Simplicity is even carried out in the cooling system, inasmuch as there is neither a fan nor pump employed, a vertical-tube radiator being the only feature. Ignition is jump spark, dual type, with a low-tension magneto and a storage battery the sources of current. This magneto not only furnishes ignition current but also supplies that of the side and tail lamps, which are part of the regular equipment of the car. The carbureter is of the Templeton-DuBrie design, with gravity feed from the supply tank. Transmission from the motor to the planetary gearset on the rear axle is by means of a multiple-disk clutch having six alternate steel and fiber disks and a driveshaft inclosed in a torsion tube. The gearset runs in oil and is in unit with a semi-floating rear axle. The frame, which is of pressed channel steel construction, rests on semi-elliptic springs in front and three-fourth platform springs in the rear.

A Welch-Detroit Is Shown

A car which should occupy a very prominent place in the field of motordom for 1910 is the new Welch-Detroit, which is manufactured by the Welch-Detroit Car Co.

Detroit. The Welch-Detroit is a seven-passenger touring car, with a four-cylinder, water-cooled, 40-horsepower motor, a selective sliding gear set, located amidships on a sub-frame with the motor, a drive shaft inclosed in the torsion tube, which is rigidly attached to the floating rear axle. It is equipped with long, broad semi-elliptic springs, has 122-inch wheel base, 36-inch wheels, extremely large brakes, and the equipment consists of five lamps, a gas tank, a trunk rack and tools. A thorough examination of this car will show points of comfort and value generally found only in the highest priced cars, and it is apparent that the various points about the car, the accessibility of the motor and its fittings and their general arrangement have been given careful attention. The general design is simple and all connections direct. The running gear is well equipped with grease cups on all moving parts. The space between the running boards and fenders is inclosed and provided with perforations to render the grease cups on the spring shackles accessible. Steering knuckles also are provided with grease cups, and leather covers are fitted to the steering rod joints. The hexagonal hood, which always has been a characteristic of the Welch cars, is still retained; the dash is of solid mahogany shrouded type and perfectly clear on the exposed side, except for a single unit induction coil and a gauge to show that the oiling system is in operation.

Body a Roomy One

A large roomy body of the straight line type is fitted, which is well finished and appointed, while the running boards are spacious and entirely clear, except for a neat toolbox on the left running board opposite the driver's seat. The motor in this car is of the T type, the valves are on opposite sides and operated off two camshafts, which are inclosed within the crankcase; all gears are inclosed and run in oil. Lubrication of the motor is maintained by a circulating splash system, in which the oil is drawn from the overflow of the crankcase, forced through sight feeds on the dash and then back into the splash compartments of the crank chamber. The oil pump is located on the end of the water pump shaft and the only external leads are one from the crankcase to the pump and those to and from the sight on the dash. The gear pump, the cellular radiator and a belt-driven cast aluminum fan are features of the cooling system. The Remy magneto, used in the dual ignition system, is gear driven and accessibly located on the right side of the motor. Transmission from the motor to the full floating rear axle is through a leather-faced cone clutch, a selective gearset giving three forward speeds and reverse, a single universal joint and a drive shaft inclosed in a tor-

(Continued on Page 30.)

Big Crowds at Washington Show

WASHINGTON, D. C., Jan. 24—"The best show Washington ever has had." That is the verdict of the thousands who thronged Convention hall tonight. A combination rain and snow storm began early in the afternoon and naturally kept down the attendance. However, the box office receipts were of gratifying proportions and if tonight's attendance is any criterion the number of show visitors will be greatly in excess of any previous affair of the kind.

From an artistic standpoint the show surpasses anything that has ever been attempted in this city. The immense hall has been transformed into a bower of beauty, with uniformity as the keynote. The inside spaces are marked by circular signs bearing the name of the exhibitor, together with the names of the cars handled by him. The spaces along the sides of the hall have oblong signs. Each stand has a massive palm at each of its four ends. The ceiling and walls are draped with flags and bunting and the riot of color is heightened by festoons of electric lights. A dozen or more flaming arc lamps help to give the show a brilliant appearance. Not the least attractive part of the show is a notable collection of aeroplanes and gliders. The full-sized models are suspended from the ceiling, while the miniature models are shown on the floor of the aeronautical section.

The demand for space exceeded all expectations. At least a dozen would-be exhibitors from outside the city could not get an inch of space in which to show their cars. Only two of the leading firms—the Dupont Sales Co. and the L. P. Dorsett Co., are not in the show.

In the crowd tonight were many people prominent in official circles, including several members of the diplomatic corps, senators, representatives, judges and those in lesser positions. Several sales were made during the evening.

But one torpedo body is on exhibition. It is a Palmer-Singer, and as it is the first to be seen in Washington it attracted more than ordinary attention.

Polished chassis are to be seen in numerous exhibits. The Elmore exhibit of Charles E. Myers is featured by the engine and motor of the Elmore car that won the sweepstakes trophy in the Munsey tour last fall. The entire Rauch & Lang exhibit at the garden show was brought to Washington.

The show committee consists of W. C. Long, chairman; John S. Larcombe, Jr., John R. Thomas, Lester D. Moore, Jr., A. G. Carter, C. E. Miller, R. C. Wilson, C. W. Bender, S. A. Luttrell and William Jose. The manager is B. R. Johnson, while H. Chadwick Hunter, president of the Automobile Club of Washington, is in charge of the aeronautical section.

The show was in complete readiness for tonight's opening, which was a pleasing departure from the practice of previous years. The Belmont Garage Co., Brush agent, was the only exhibitor whose cars failed to arrive. The complete list of exhibitors is as follows:

Luttrell Co., Packard.
Wilson Co., American Simplex, Regal, Hupmobile, Woods.
Commercial Automobile and Supply Co., E-M-F, Flanders, Studebaker.
Carter Motor Car Corporation, Washington.
Buick Motor Co., Buick, Welch.
Overland Sales Agency, Overland, Marion.
White Co., White.
L. D. Moore, Jr., Palmer-Singer, Reo, Premier.
Motor Sales Co., Moon, Rauch & Lang.
Cook & Stoddard Co., Pierce-Arrow, Franklin, Cadillac, Baker.
John R. Thomas Automobile Co., Maxwell.
Pope Automobile Co. of Washington, Pope-Hartford, Matheson, Oakland, Waverley.
Motor Car Co., Chalmers-Detroit, Peerless, Stevens-Duryea, Hudson.
Miller Brothers Automobile and Supply Co., Ford.
Belmont Garage Co., Brush.
John J. Fister, Winton, Mora.
Warner Motor Co., Crawford.
Newbold-Speedwell Co., Speedwell.
Standard Garage Co., Locomobile.
Charles E. Myers, Elmore.
Barnes & Hendrick, Pullman.
Washington Motor Vehicle Co., Capital delivery wagons.
Sinclair-Scott Co., Baltimore, Md., Maryland.
Carl Spoerer's Sons Co., Baltimore, Spoerer.
C. C. Schroth, Stearns.
Terminal Taxicab Co., Royal Tourist.
Baltimore Buggy Top Co., R. M. Norris, tops, etc.
National Electrical Supply Co., motor car supplies.
J. F. Collins, Wayne tanks.
Electrical Speedometer and Dynamometer Co.
Standard Oil Co.
C. D. Davis, motor boats.
Westinghouse Electric and Mfg. Co.
Paluxent Lumber Co., portable garages.

KANSAS CITY LIKES SHOW

Kansas City, Mo., Jan. 25—The show of the Motor Car Trade Association in Convention hall ended last night. All of the exhibitors reported a great abundance of good prospects that should crystallize into sales within a few weeks. "Our date is about a month too early," Fletcher Cowherd, Jr., a member of the show committee said. "Country dealers like to come to a show just when their selling season opens, and that's in March and April."

This was also borne out by R. H. Collins, manager of the Buick Motor Co.; M. C. Nolan, of the Nolan-Rieke Motor Co., representative of the Stevens-Duryea, and other exhibitors. However, in one order placed yesterday the Buick Motor Co. believes it achieved the biggest single order ever made by a factory branch. The Adams Auto Co., of Hiawatha, Kan., contracted for fifty-one carloads of Buicks—153 cars—to be shipped as soon as deliveries can be made.

The fourth exhibition of the Kansas City Automobile Dealers' Association comes the week of February 28. Eighty makes of cars will be shown. Convention hall is to be so reconstructed that much more exhibit space than there is in Madison Square garden will be available, it is claimed. A second arena is to be built over the boxes and balcony of the hall. Genuine trees, stone walls and hedge fences are included in the decoration idea.

Quaker Show's Second Week On

PHILADELPHIA, PA., Jan. 24—Promptly at 11 o'clock Saturday night a big force of workmen started to dismantle the Third Regiment armory here in preparation for the second week of the ninth annual show of the Philadelphia Automobile Trade Association. It is a bigger contract than it sounds, involving as it does the taking away of the upwards of a hundred cars that made up the first week's show, entirely revamping the floor-space schedule and installing the three-score exhibits which go to make up the second half of the show. It was a 36-hour job, and it was not till midday today that the tired workmen and exhibitors were able to get away, the latter for a few hours' nap before the real labor of the week begins.

This week's show will be made up of fourteen exhibits of pleasure vehicles for which room could not be found in the armory last week, eight commercial car displays, four of electrics, three of motor cycles and over a score of accessories exhibits. As far as variety is concerned, this week's show will out-class last week's, which was devoted to pleasure cars alone.

Quite an array of the recent arrivals here are included in the pleasure car section this week, among them the Cole 30, Springfield, Otto, Empire, Halliday, Flanders and Rainier, although the last named was represented here a couple of years ago. The Detroit electric and the big Packard and commercial trucks, the Martin wagon and the Crane & Breed also will make their first appearance in a show here during the present week.

Following is a list of the exhibitors for the last half of the show:

SECOND WEEK'S EXHIBITORS

GASOLINE PLEASURE VEHICLE SECTION

Autocar Co.....Autocar
B. C. K. Motor Car Co.....Kline-Kar
Collings Carriage Co.....Rainier
E-M-F and Flanders Agency.....E-M-F and Flanders
Haynes Automobile Co.....Haynes
Imperial Auto Co.....Imperial
Krause Motor Car Co.....Halladay
Longstretch Motor Car Co.....Pullman
Motor Supplies Co.....Empire
North Phila. Auto Station.....Knox
Otto Gas Engine Works.....Otto
Springfield Motor Car Co.....Springfield
Studebaker Brothers Co.....Studebaker
Stozle-Vogel Auto Co.....Cole 30

ELECTRIC SECTION

Bartlett, J. C.....Woods
Collings Carriage Co.....Waverley
Parker, J. C., & Son Co.....Detroit
Westinghouse Elec. and Mfg. Co.....Batteries

COMMERCIAL VEHICLE SECTION

Autocar Co.....Autocar
Collings Carriage Co.....Crane & Breed
Commercial Truck Co.....Commercial
General Vehicle Co.....Commercial trucks
Mack Bros. Motor Car Co.....Mack
Martin Carriage Co.....Martin
Packard Motor Car Co.....Packard
Studebaker Brothers Co.....Studebaker

ACCESSORIES SECTION

Auto Equipment Co.....Accessories
Auto Light and Motor Supply Co.....Accessories
Auto Wind Shield Co.....Wind Shields
Bretson Mfg. Co.....Detachable treads
Fiatje, Ernest.....Shock absorber
Gibney, James L, & Brother.....Accessories
Garnet Bracket Mfg. Co.....Combination lamp and license bracket
Home Rubber Co.....Home tires
Howard Demountable Rim Co.....Demountable rims
Hydraulic Oil Storage Co.....Storage tanks
Keystone Lubricating Co.....Oils and greases
Lyon Non-Skid Co.....Non-skid grips
McCullough, J. H., & Son.....Accessories
Miller, Charles E.....Accessories
Nock, George W., Co.....Accessories
Paul & Herst.....Vacuum cleaner
Penn Auto Supply Co.....Accessories
Perfection Wrench Co.....Wrenches
Phila. Storage Battery Co.....Changing devices
Puritan Soap Co.....Soaps and greases
Red Star Oil Co.....Oils and greases
Rose Mfg. Co.....Neverout lamps
Salman, John A.....Monograms
Sanford, William, Co.....Shawmut tires

The weather last week was enough to discourage anyone less sanguine than General Manager Beck. Snow, rain, sleet and slush reigned for 4 of the 6 days. There was a let-up on Wednesday, and then the public poured into the armory in such numbers as to create a new attendance record. Thursday was dollar day, which, with some more manifestations of the weather man's power, kept the crowds down; but it was the best business day of the week. By the way, it is from a business standpoint that this show will go down in the records of the Philadelphia Automobile Trade Association as the best ever, whatever the box-office results may be. None of the thirty exhibitors who were doing business last week in the armory failed to score liberally in the matter of sales, while the Maxwell, Ford, Locomobile, Mitchell, Studebaker and other concerns which use Philadelphia as a distributing center reported a surprisingly large number of cars disposed of—actual sales as well as cars placed with agents. The present week promises to be as prolific in this respect.

During the present week society nights—as the dollar-admission periods have been dubbed—will be Wednesday and Friday. In addition, Wednesday night will be especially devoted to the army and navy men stationed in and around Philadelphia, who will be entertained with a demonstration of the utility of the commercial cars as adjuncts to the transportation service of both branches of the country's defenders.

The one feature of the first half of the show which attracted attention not alone by reason of the fact that it was a first appearance, but also because it is a local product, was the fine-looking four-cylinder Bergdoll 30, built by the Bergdoll Motor Car Co., at its Broad and Wood streets factory. It will be marketed in three styles—touring car, tourabout and runabout. With a wheelbase of 112 inches, a tread of 56 inches and an all-pressed-steel channel section frame, the Bergdolls have insured a firm foundation for the 4 by 4½ motor. The carbureter is of the float feed, automatic type, waterjacketed; clutch, multiple disk, running in oil; drive, bevel gear, single universal joint, drive shaft in tube; storage battery and coil ignition and special equipment for double ignition with magneto; selective transmission, three speeds forward and reverse; valves of nickel-steel, large diameter, exhaust at side, inlet at top of cylinders; constant level splash lubrication operated by gear pump, with sight feed on dash; worm and irreversible steering gear; bearings throughout running gear of full annular ball type, with silent type annular ball bearings in transmission and in motor crank shaft. The brakes are contracting band, 8-inch diameter, 3-inch face, on drive shaft—thermoid lined—and 14-inch internal expanding, 2-inch face, rear wheel brakes—cast iron on steel—all double-acting. The rear axle is of the full floating type, heat-treated nickel-steel shafts; front axle, single-piece drop forging, I-beam section. The 34-inch wood wheels are of the artillery type, with large hub flanges and heavy spokes; 34 by 3½ tires are fitted with all three styles of body.

In no former year were individual shows so much in evidence or on so pretentious a scale. While every row establishment prinked up somewhat for the show weeks, whether represented in the armory or not, the number of big displays at the various branch houses and agencies either not represented in the main tent during the first week or not at all was the subject of comment. The Hipple-Chalmers Co.'s exhibit has the full national show quota of Chalmers-Detroit and Hudson cars, racing Bluebeards included. The dozen-a-day E-M-F-Flanders show in its temporary quarters at 1231 Chestnut street drew like a Saturday night moving-picture show.

It looked very much as if the trolley strike which is now brewing in the Quaker City would come to a head during the week, but it failed to materialize. The show management was prepared for emergencies, however, and arranged with the owners of sight-seeing buses, the Autocar, Packard. Commercial and other concerns handling business vehicles to install a temporary motor bus line from Broad and Chestnut streets to the show.

The Motor Co., local Premier agent, made a hit with a daily issue of the Motor Company News, a publication which, although devoted primarily to Premier interests, found space to dwell on the foibles and shortcomings of fellow-exhibitors in a way at which no one could take offense and which everyone enjoys.

TWO SHOWS IN CLEVELAND

Cleveland, O., Jan 26—Cleveland is to have two shows. The fifty and odd motor car dealers here have divided into two groups. The local car makers and a number of the older dealers will have a show in Central armory opening Saturday evening, February 19, and closing Saturday night, February 26. More than thirty local dealers and many of the branch house managers will have their show in the same building from Saturday evening, March 5, and running to Saturday night, March 12. Both show managements are meeting with great success in filling in with accessory exhibits and each will vie with the other to excel in decorative features. Frank Phillips, H. S. Moore and H. M. Adams are the committee in charge of the first show. Ray M. Colwell, W. H. Barger and C. S. Clampitt represent the dealers on the management of the second show, of which George Collister is the manager.

CHICAGO'S COUNT SHOWS 267 EXHIBITORS

CHICAGO, Jan. 25—Every inch of the available 89,000 square feet of space having been disposed of, Samuel A. Miles, general manager of the N. A. A. M., now is taking his mind off the exhibitors for awhile and is devoting all his time and attention to other details in connection with the promotion of the tenth show in the Coliseum and the First Regiment armory. His greatest troubles now have to do with the decoration of the building, the work in this line being greatly increased because of Manager Miles' elaborate plans. He has cut away from the conventional and has called in Dame Nature to properly deck the big buildings and afford a suitable background for the display of motor cars and accessories. The scheme has to do with the forest and to carry it out Mr. Miles is importing a big bunch of oak trees from Wilmette, which even now are on their way to Chicago.

As the count stands today there will be 267 exhibitors in the show, a smaller number than last year, which is explained by the fact that Mr. Miles has routed from the basement of the annex some twenty makers of accessories and given the entire space to the car people. This, of course, cuts down his total number of exhibitors, but in reality he has a bigger show because of the fact he has more makes of cars promised for exhibition than ever before. His waiting list is a long one, numbering about 130, and at this writing there is small chance of any of them being cared for. During the past week Mr. Miles did manage to squeeze in four makers of cars, putting them into the basement and making four spaces out of two. Here will be the Diamond T Motor Car Co., Monitor Auto Works and the A. C. Clark Carriage Co., all of Chicago, and the Springfield Motor Car Co., of Springfield, Ill. In addition to this the Pierce Motor Co., of Racine, has been accommodated in an odd corner of the armory. The Pittsfield Spark Coil Co. has been admitted through the courtesy of a couple of exhibitors in the gallery of the Coliseum, the Pittsfield concern getting part of one space and part of another. Only one withdrawal of a car maker has been noted, that one being the Holsman Automobile Co., of Chicago, which went into a receiver's hands recently and whose show entry was scratched only last week. This robs the motor buggy branch of the industry of its lone representative in the show. None of the high-wheelers was shown at New York and there will be none in Chicago.

The two show buildings will be turned over to Manager Miles next Sunday morning and he will take possession immediately following the close of the electrical shok, which has had a 2 week's run. So well are his plans matured that he expects to have everything in readiness for the exhibitors a day ahead of scheduled time. It is probable that the early ones can start moving in on Thursday, February 3, although Friday is the official time. With such a fine start it is anticipated that there will be no difficulty whatever in having the show ready for the opening at 1 o'clock Saturday afternoon.

Announcement is made by the N. A. A. M. that the Central Passenger Association has granted a rate of one and one-half fare to all visitors to the Chicago show, provided that not fewer than 1,000 present their certificates to the railroad authorities at the Coliseum. The rate is granted on account of the convention of the American Automobile Association and not because of the show, but membership in the A. A. A. is not essential. As advised by the N. A. A. M., a person contemplating a visit to the show should secure from the ticket agent in his home city one of the certificates issued on account of the A. A. A. convention. This certificate must be on the form regularly used by the railroad for the purpose. An ordinary form of receipt will not be accepted. Upon arrival in Chicago this certificate should be presented to the agent of the Central Passenger Association at the A. A. A. headquarters in the armory, who will be in attendance from 9 a. m. to 12 m. and from 1 p. m. to 5 p. m. daily from February 5 to 12 inclusive, Sunday excepted. A fee of 25 cents will be charged for validating these certificates. Of course full fare will have to be paid coming to Chicago, but the half-fare rate will be in effect on the return journey, provided 1,000 or more tickets have been sold. A person may leave home at any time between Wednesday, February 2, and Monday, February 7, both days inclusive, and may leave on the return journey at any time after 1,000 certificates have been presented and validated up to and including Wednesday, February 16.

The territory embraced by the Central Passenger Association covers Indiana, Ohio, Michigan, and a part of Illinois, northern Kentucky, east and West Virginia, western Pennsylvania, and western New York. An effort will be made to secure the coöperation of the Trunk Line Association and the Western Passenger Association.

TAKE SPACE AT MILWAUKEE

Milwaukee, Wis., Jan. 24—The Buick Motor Co. will be the largest exhibitor at the second annual Milwaukee motor show to be given under management of the Milwaukee Automobile Club in the new Auditorium from February 22 to 27 inclusive. The Buick factory, through George P. Hewitt, manager of the new Wisconsin branch, has contracted for four full spaces. The Kisselkar company will show cars in three spaces, and the Johnson Service Co., of Milwaukee, has a like number. The Wisconsin Machinery and Mfg. Co. will show the motors it makes. The first drawing for spaces was held last week, and judging from the large number of applicants the withdrawal of a number of Milwaukee dealers will not affect the prospects of a successful show as greatly as anticipated. Milwaukee society will hold forth on the opening night, which falls on Washington's birthday, and Governor James O. Davidson and staff and state officials as well as legislators will be guests of honor. The main arena contains sixty-two boxes and loges and 8,000 seats. It is anticipated that Milwaukee will be a greater success this year than ever, because of the general enthusiasm that is being shown at the present time by Wisconsin motorists.

MORE FOR BALTIMORE

Baltimore, Md., Jan. 23—The tardy dealers who failed to signify their intention of having exhibits at the Baltimore show, February 22 to 26, at the Fifth Regiment armory, when the first and choice allotment of space was made by the show committee of the Automobile Club of Maryland, are now falling into line. Fifteen of these got in the past week, swelling the total number of exhibitors up to forty-three. The latest exhibitors are: Stoddard-Dayton Baltimore Auto Co., Renault and Stoddard-Dayton; Auto School and Garage, Cameron; Automobile College; Howard A. French Co., motor cycles; W. P. Shuler, Mitchell; Norwood Brothers, Velie; Sinclair-Scott Co., Maryland; McMullen-George Auto Co., Stearns; J. J. Smith, supplies; Charles Elliott & Co., supplies; Huff-Ford company, supplies; Johnson & Johnson, supplies; R. Milton Norris, supplies; Tiona Oil Co.; International Harvester Co.

TWO SHOWS IN HARTFORD

Hartford, Conn., Jan. 24—Hartford is to have two shows instead of one as originally outlined and neither one will run in opposition to the other. The local situation is a bit complex for the reason that no hall that is available is sufficiently large enough to accommodate all those who wish to show. The second show, which is to run the same dates as the original exhibition, that is the third annual show of the Hartford Automobile Dealers' Association, is to be held at the old First Infantry armory on Elm street by James H. Clarkin, A. L. Beck and A. E. Lazarro, who style themselves the Connecticut Automobile Show Association. For the original show all the floor space has been sold out and everything points to its complete success. The opening of the Elm street armory will make it possible to show a number of cars, newcomers not in the original show, which could not secure space in Foot Guard hall where the dealers' show is to be held. It is believed that the two shows will be handled harmoniously.

BAY STATE TAKES A VALUABLE ROAD CENSUS

BOSTON, MASS., Jan. 22—The Massachusetts highway commission has sifted through the mass of data that was gathered in what was the first practical road census taken in this state when records were kept of traffic during August and October last year and the result has been highly gratifying. For the first time it is possible now to take a map and plot out just what are the real main arteries of travel. Of course a few of these were known long ago, but not until now has the general public been given any idea of it. The commission now has mapped out what are the primary or trunk line highways of the Bay State. There are just twenty-two of these, and when connected up they form two main east and west and eight or nine north and south routes that bear the larger part of vehicular traffic of all kinds.

Most important in value is the fact that this work shows the commission just where the weight of traffic on state roads takes place, the relative amount of horse-drawn and motor-propelled traffic, and thus enables it to determine where the development of state highways is most needed and what sort of road is best suited to a given locality. Where the horse traffic predominates the ordinary water-bound macadam road answers every purpose, but where the larger part of travel is by motor car, some sort of bituminous binder is required.

When the highway commission was organized in 1893 there was little need of through roads because the only long distance traffic was by moving vans and bicycles. The commission therefore bent its energies chiefly to the construction of improved roads from town to town. Since 1900, however, motor cars have become so numerous that long distance travel is common. and the commission's aim has been to build connecting lines of roads. The arrival of motor cars also made necessary a change in the method of construction, but there lacked a thorough knowledge of traffic and so the plan of taking the census was evolved. Its benefits will be national, for highway commissioners in other states learning of the great value derived from it will no doubt follow along similar lines in their own states, and in the end save large sums of money by building roads to last where they are most needed.

The August census was taken to determine these facts in the period of abnormal traffic that includes June, July and August, when there is a big increase in the list of motorists due to the visitors from other states, while the October census was expected to show the travel under normal conditions to be found in fall and spring. The August census showed from figures taken at 237 stations on state highways an average of 58 per cent horse-drawn vehicles and 42 per cent motor-driven vehicles. The October census was taken at 240 stations and showed that the percentage was 65 horse-drawn and 35 motor vehicles. A daily average of 64,900 vehicles were counted in August and 52,952 in October.

It is interesting to note the percentage of motor cars on the various routes, showing the trend of traffic, the Berkshires, for example, being popular going through to New York state or from there to the mountains, and the north shore section equally popular going to the seashore resorts along the coast of New England. The twenty-one primary routes and the traffic figures percentage are as follows:

1—Lowell to Newburyport via Tewksbury, Andover, Lawrence, Haverhill and West Newbury. August, 34 per cent motor cars; October, 29 per cent motor cars.

2—Boston to Worcester, via Newton, Weston, Wayland, Sudbury, Marlboro, Northboro and Shrewsbury. August, 50 per cent motor cars; October, 56 per cent motor cars.

3—Boston to Portsmouth via Lynn, Salem, Beverly, Wenham, Ipswich, Rowley, Newburyport and Salisbury. August, 60.9 per cent motor cars; October, 40 per cent motor cars.

4—Fall River to Providence via Somerset, Swansea and Seekonk. August, 34 per cent motor cars; October, 28 per cent motor cars.

5—Boston to Lowell via Somerville, Medford, Arlington, Winchester, Woburn, Burlington and Chelmsford. August, 43 per cent motor cars; October, 46 per cent motor cars.

6—Boston to Providence via Dedham, Westwood, Norwood, Walpole, Norfolk, Wrentham, Plainville and North Attleboro. August, 43 per cent motor cars; October, 35 per cent motor cars.

7—Boston to Plymouth via Quincy, Weymouth, Hingham, Cohasset, Scituate, Marshfield and Duxbury. August, 59 per cent motor cars; October, 38 per cent motor cars.

8—Fitchburg to Greenfield via Westminster, Gardner, Baldwinsville, Phillipston, Athol, Orange, Erving and Montague. August, 40 per cent motor cars; October, 34 per cent motor cars.

9—Greenfield to North Adams via Charlemont. August, 7 per cent motor cars; October, 6 per cent motor cars.

10—Greenfield to Holyoke via Amherst and South Hadley. August, 21 per cent motor cars; October, 19 per cent motor cars.

11—Worcester to Fitchburg via West Boylston, Sterling and Leominster. August, 36 per cent motor cars; October, 45 per cent motor cars.

12—Boston to Fitchburg via Lexington, Concord, Acton, Littleton, Groton and Shirley. August, 48 per cent motor cars; October, 47 per cent motor cars.

13—Greenfield to Springfield via Deerfield, Whately, Hatfield, Northampton and Chicopee. August, 33 per cent motor cars; October, 31 per cent motor cars.

14—Worcester to Springfield via Leicester, Spencer, Brookfield, Warren, Palmer and Wilbraham. August, 63 per cent motor cars; October, 58 per cent motor cars.

15—Pittsfield to Vermont line via Cheshire, Adams and North Adams. August, 31 per cent motor cars; October, 24 per cent motor cars.

16—Springfield to Pittsfield and New York line via West Springfield, Westfield, Russell, Huntington, Becket, Jacob's Ladder, Lee, Lenox and Pittsfield. August, 46 per cent motor cars; October, 50 per cent motor cars.

17—Boston to Bourne—Cape Cod—via Randolph, Bridgewater, Middleboro and Wareham. August, 57 per cent motor cars; October, 42 per cent motor cars.

18—Springfield to Connecticut line via Agawam. August, 47 per cent motor cars; October, 5 per cent motor cars.

19—Groton to Northampton via Townsend. August, 18 per cent motor cars; October, 31 per cent motor cars.

20—Worcester to Providence via Millbury, Sutton, Douglas and Uxbridge. August, 16 per cent motor cars; October, 6 per cent motor cars.

21—Bourne to Provincetown via Sandwich, Yarmouth, Orleans and Wellfleet. August, 49 per cent motor cars; October, 22 per cent motor cars.

These twenty-one primary routes or trunk lines, when transferred to a map of the state, resolve themselves into continuous east and west or north and south lines. Thus routes 12, 8 and 9 make up the northerly route from Boston to the western boundary of Massachusetts, while routes 2, 14 and 16 make up the southerly route through Worcester and Springfield. Routes 5, 1 and 3 comprise the popular circuit from Boston to Lowell, down the Merrimac valley to Newburyport and back to Boston by the North Shore route. Route 15 is the most westerly of the north and south trunk lines, routes 10 and 13 give an alternative route along the Connecticut river, routes 11, 20 and 4 are the main line between Fitchburg, Worcester, Providence and Fall River, route 19 leads from Groton to the New Hampshire line, routes 6 and 4 are the roads most used between Boston, Providence and Fall River, routes 17 and 21 and the line from Boston to Cape Cod and route 7 is the main line from Boston to Plymouth.

It is interesting to note that in the main the highway commission has followed these general routes in the development of the system of state roads. The southerly east and west route is completed practically from end to end of the state, while there are comparatively few miles of unimproved road in the northerly route. Most of the north and south routes are also largely state highway. Doubtless the presence of so much state highway along these routes is responsible for the large percentage of motor car traffic.

INDIANA MAKES ITS COUNT

Indianapolis, Ind., Jan. 24—Approximately $10,000,000 in new capital has been invested in the motor car and kindred industries in Indiana since January 1, 1909. The books of the secretary of state show that concerns organized and making increases in capitalization during that time have represented a total stock investment of $9,183,000. To this, of course, must be added the innumerable companies organized during the last year and which were not incorporated. There were seventy-two concerns organized from January 1 of last year to January 20 of this year and in addition six companies made increases in capital stock to the amount of $2,530,000. The concerns had an authorized capitalization of $6,653,000. The classification of new companies and their capitalization was as follows:

21 motor car manufacturers	$3,561,000
23 parts manufacturers	1,290,000
16 agencies and garages	219,500
3 car distributors	22,500
7 makers of tires and appliances	189,000
1 motor cycle manufacturer	100,000
1 motor car insurance company	1,000,000
1 motor cycle delivery service	10,000
1 motor car transfer company	2,000
1 motor car supply company	4,000
Indianapolis Motor Speedway Co.	250,000
1 motor car college	5,000

BUYS EDISON BATTERY

Detroit, Mich., Jan. 25—The Anderson Carriage Co., manufacturer of the Detroit electric, has bought the right to the use of the new storage battery, recently invented by Thomas A. Edison. The battery involves no lead in its construction and is said to possess great advantages for motor car use. It has proven a success on several cars in which it has been tested here during the past month.

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Has Valuable Road Data

THE state of Massachusetts is taking the lead at the present time in the matter of carefully studying road traffic and estimating the amount of wear and tear on different kinds of roads by motor cars as compared with horse vehicles. The highway commission of the state is performing an admirable work in this respect, as its report shows the percentage of motor cars in the total vehicle traffic over certain roads. On certain roads leading from Boston to prominent summer resorts and points of interest, the motor car constitutes as high as 59 per cent of the traffic; whereas, on less frequented roads this percentage drops to 14 and in some cases 20, 25 and 30 per cent. It is only by careful checking of traffic in this manner that definite results regarding the wear and tear of motor cars on country roads can be arrived at. Generalities can never be considered proof, but where facts are given the actual conditions can be estimated. In Massachusetts, in the course of 3 or 4 years, it will be possible for the highway commission to know exactly what kind of roads are best suited for motor cars, and it will be natural that the commission at the end of such time will direct its road-building efforts in accordance with the results obtained.

NOT only is the Massachusetts highway commission doing a valuable work in its close checking on road traffic, but its recent experiments with dust-laying fluids show that the members of the commission are up-to-date, and aware of real factors in connection with motoring. In England, which country is reputed with having the best motoring roads in the world, the dust problem is the greatest and has called for a greater expenditure of energy than any other phase of the road situation.

THE development of amateur sports is apparently going to receive some attention at the hands of the present contest board of the American Automobile Association, and nobody wishes this board greater success in this regard than Motor Age. Amateur motor sport in America has not had a very healthy existence up to date. According to past practices, an amateur has been anything from a professional Vanderbilt cup driver to a country doctor with a two-cylinder car. The previous definition of an amateur has been misleading, having as many interpretations as there have been cases of dispute on amateur standing. The method of the present board to register amateurs and give them amateur cards is an excellent one, and the reconstructed definition is also good. For 1910 an amateur cannot be a person actively engaged in the motor or accessory business; and although it is not imperative that he drive his own car, it is clearly stated that he cannot drive the car of any one actively engaged in the motor or accessory business. This double safeguard takes the amateur situation well out of the manufacturers' hands, and if lived up to, will mean that the amateur situation will be recognized in 1910 as it has never been recognized before. The amateur phase of motoring must be developed, and it can only be developed by seeing that the amateur standing is closely adhered to in all contests. Last year good amateur trophies were put on on several occasions, but instead of Simon-pure amateurs contesting for these, in some cases demonstrators, and in other cases salesmen actively engaged in the selling of motor cars, were permitted to drive cars owned by manufacturers, so that the amateur phase of the situation became the greatest kind of a farce. It is to be hoped this kind of condition is over.

Wanted—Horsepower Formula

IT is questionable if any one phase of the motor car is disturbing the buying public more today than the question of horsepower. Motor Age is weekly in receipt of many communications requesting a satisfactory formula for the determination of the horsepower of different cars offered for sale this year. These numerous communications give evidence of a feeling of discontent among the buyers of cars. They indicate two things in particular: First, that a goodly fraction of the buying public has not confidence in the present formulæ for the determination of horsepower, and second, that this public has not confidence in the ratings many manufacturers give their motors. Both of these are regrettable conditions and there must be a reason for this dissatisfaction. Undoubtedly, the trouble with the present horsepower formulæ, and particularly that adopted by the A. L. A. M., rests in the introduction of a long-stroke motor, which had its inception in the 4-inch race conducted on the Isle of Man some years ago. This formula fails to take direct recognition of the length of stroke, excepting in connection with a piston speed of 1,000 feet per minute, on which the formula is based. No amount of explaining seems to satisfy the public on this horsepower rating situation, and it is opportune time for the licensed association to now launch a new formula which will more satisfactorily meet the varied conditions of the motor situation of today.

ONE of the leading merits of the present formula is its simplicity, and it must not be forgotten that those who drafted this equation had in view the furnishing of what might be called a ready-reference scheme of estimating horsepower for comparative purposes, rather than a formula considered suited for all conditions from the viewpoint of the engineer. As a ready-reference guide the formula proved satisfactory until the long-stroke motor became a big talking factor with many makers.

REGARDING the necessity of a formula because of the lack of confidence many buyers have in the ratings of motors as given by makers, it is safe to say that the necessity is as great in this case as in the other. This is largely due to the different ratings given motors of the same size by different makers; one manufacturer of a motor with 5-inch bore rates it at 30-horsepower, and another with a 4¾-inch bore rates it at 40-horsepower. This present condition of affairs will not rectify itself, and individual makers will be slow to take steps that will lead to a concerted action. Something should be done to relieve the present chaos, and undoubtedly the best solution is the adoption of a more intricate formula, one in which the bore and stroke as well as the compression and crankshaft revolutions per minute will be taken into consideration.

EVEN with such a formula completely satisfactory results will not be obtained, because no formula that has yet been devised can possibly take into consideration engineering questions which are the big problems in deciding the power of a car. A separate formula cannot be obtained for valve-in-the-head motors; a separate formula cannot be devised for some of the slide-valve motors which are being brought out; and a separate formula cannot be used for other varied types, in spite of the fact that certain of these constructions result in increased power as compared with other types of cylinders.

SELDENITES HAVE MADE 244,245 MOTOR CARS

PRODUCTION			
1903	10,576		
1904	13,724	51%	increase
1905	20,787	51%	increase
1906	29,320	41%	increase
1907	34,568	18%	increase
1908	40,379	17%	increase
1909	94,891	130%	increase
Total	244,245		

CHICAGO, Jan. 19—The Association of Licensed Automobile Manufacturers has given out this week statistics covering the number of licensed cars which have been manufactured from 1903 to 1909 inclusive, and accompanies this with a chart, reproduced on this page, which shows graphically the number of cars sold each year, beginning with 10,576 cars in 1903, and ending with 94,891 in 1909. It shows that a total of 244,245 cars have been sold to date by licensed manufacturers. Perhaps nothing is more noticeable in this chart than the enormous increase of the 1909 output as compared with the 1908 product.

The figures indicate that the licensees under Selden patent alone made 94,891 cars in 1909. This is believed to be about 85 per cent of the cars made. The compilers have added to these figures 20,000 cars as the product of the outsiders, making a total production for 1909 of 114,891 cars—far in excess of what was indicated 6 or 8 months ago, when it was declared that not more than 80,000 cars would be made.

The figures indicate very clearly that production has reached a point that warrants at least a careful look into the future by the makers. There is nothing on the business horizon now to indicate that the present year will be anything but a prosperous one for the motor car builders, yet the figures show on the chart, prepared and issued by the A. L. A. M., are deemed worthy of the deepest thought.

Prior to the decision sustaining the Selden patent last September, the business of the motor car builders was divided, but since the decision and the application for and granting of licenses to a score or more additional makers the licensed product amounts to not less than 85 per cent of the total business. All the Selden patent licensees conduct their business independently of each other and in strict competition.

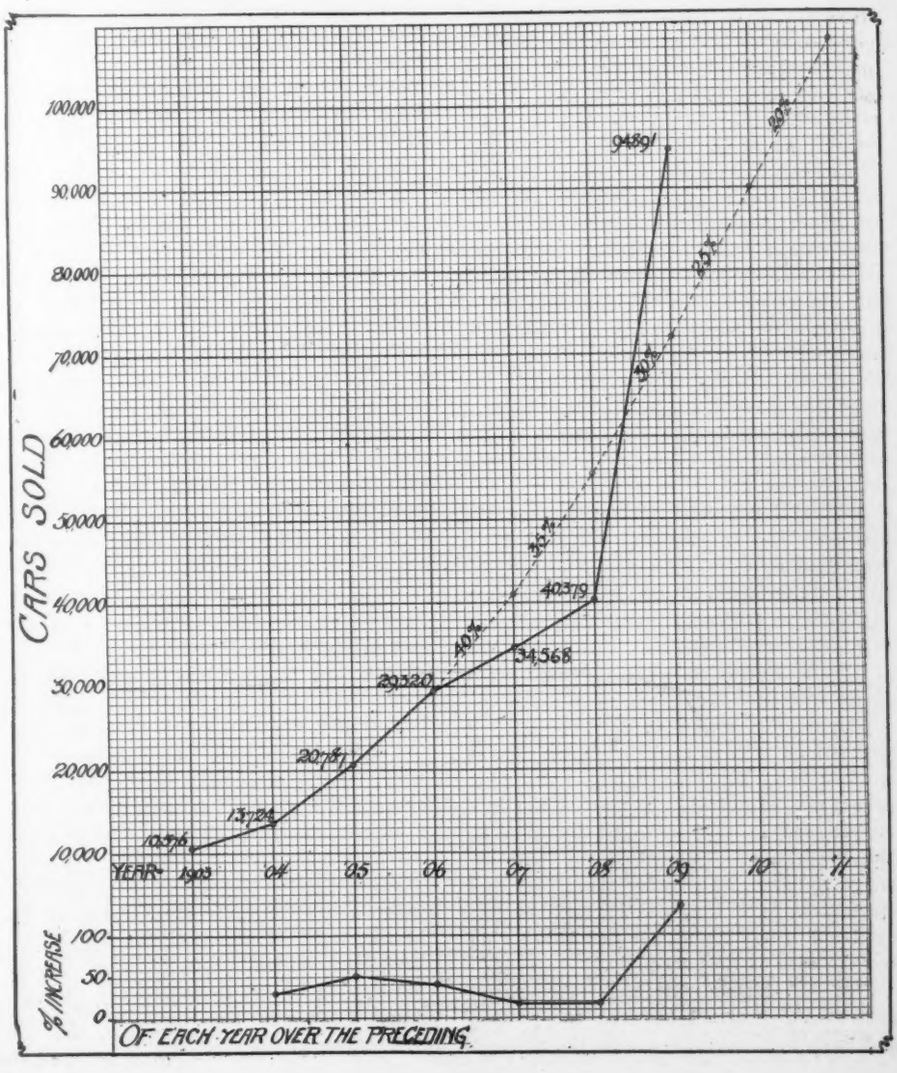
It must be remembered that the 94,891 cars indicated above are authentic beyond all dispute, and the 20,000 estimated as the production of the outsiders and beginners is considered conservative.

The most startling point about the figures for 1909 is the fact that they show an increase of 13 per cent over the 1908 production when 40,379 cars were made by the licensed makers. The percentages of increase from 1903 to 1908 are of course for the licensed product, but it is easy to figure that in no year was there a greater increase than about 55 per cent. The chart is particularly interesting as indicating the jumps in production from year to year.

At the bottom of the chart appears a smaller chart showing the percentage increase of each year over the preceding year, this chart showing the progress of events from the beginning of 1904 to the end of 1909. It shows there was an increase in 1905 over the product of 1904. Following this comes a slight decrease in 1906 and another one in 1907. During 1908 the situation remained practically as it was at the close of the preceding year, and then in 1909 came the enormous jump, as indicated by the rising line. It was during the years 1906, 1907 and 1908 that the membership of the organization remained practically stationary. This in itself would not account for a decrease in percentage, as compared with 1905, as many of the concerns were increasing their output annually. During these years, however, there were some weaker members whose output was regularly diminishing, and during which years some of the concerns dropped out of existence and so the loss in output in this way was not compensated for by the increased output of the healthy licensed manufacturers at that time.

According to the above statements given out by the licensed association, placing the product of outside firms during 1909 at 20,000 cars, Motor Age thinks this figure too low. If it were accurate it would mean that the total output of licensed and unlicensed cars for last year was 114,891 cars, whereas, it was from 10,000 to 15,000 in advance of this figure. This calculation places the output for the year, conservatively, at 130,000 cars, which means one car for every 661 population in the country, reasoning on the assumption that all of these were for home buyers, which is not correct, as probably a score of makers have an export trade of fair proportions.

A. L. A. M. Annual Car Production Chart



Arguments Are Heard In Studebaker-E-M-F Case

Detroit, Mich., Jan. 25—Arguments in the combined request for injunction and damages of the Studebaker Automobile Co., of South Bend, Ind., against the Everitt-Metzger-Flanders Co., of Detroit, were taken up today before Judge Swan in the United States circuit court. John S. Miller, of Chicago, representing the Studebakers took up the large part of the morning session of the court in an argument in favor of enjoining the E-M-F from disposing of its cars independently of the Studebakers, who hold a contract providing for the exclusive sales rights. Mr. Miller took the ground that the E-M-F company was not justified in annulling the contract and declared that, unless his clients receive redress in the form of action by the court, they will lose heavily on account of money and time spent in organizing a sales department for the E-M-F and in exploiting the sale of the product of the local factory.

Mr. Miller reviewed the entire history of the E-M-F and devoted great attention to the conditions which induced the firm to enter into the contract with the Studebakers. He read letters from President Walter E. Flanders, of the E-M-F, in which the latter admitted the tremendous advantage which his firm would secure by succeeding to the use of the sales department of the Studebaker, already organized. Reading the contract, Mr. Miller dwelt longest on the section which provided that, in case the number of advance orders for any months fell below 1,500 cars the board of directors of the E-M-F company might meet in special session and either retrench on expenses, decide to sell cars independently of the Studebakers, or give the latter opportunity to relieve the situation. This last clause Miller construed into an option conferring a prior right to the Studebakers. He declared that the course of procedure of the E-M-F directors had been irregular in repudiating the contract.

In the E-M-F affidavits several of the directors of the company testified to a statement by F. S. Fish, one of the Studebaker stockholders in the Detroit company, in which, in referring to the 1910 schedule of 15,200 cars, he said:

"These schedules were prepared with great care and they will be adhered to; we have every reason to believe that you will not be able to build as many cars as we can sell; if, through any unforeseen cause, we are not able to market the cars enumerated in that schedule by months, the Studebaker Automobile Co. will arrange to take and pay for those cars and store them until they can be sold; so you need not worry about our not being able to take care of that schedule."

This Mr. Miller maintained formed no part of the contract between the parties and denied to have been with the consent of the other directors of the Studebaker company. Mr. Miller, however, frankly stated that the Studebaker company now stood ready to take all the E-M-F cars manufactured and in process of manufacture.

Elliott G. Stevenson, of Detroit, answered Mr. Miller in the afternoon, speaking for the E-M-F company and defending the company's action in breaking with the Studebakers, on the ground that such action was taken to avoid actual financial ruin which was being brought on by the failure of the Studebakers to take and pay for the E-M-F cars, the object being, according to his argument, the forcing of the local concern into a position where it would be compelled to combine with the Studebakers in a proposed merger of factories in which its own identity would have been lost and the value of its stock greatly diminished.

At the conclusion of the arguments both sides were given 3 days to file briefs, after which Judge Swan will take the matter under advisement. A decision may be rendered within a week.

MINNESOTA STATE BODY MEETS

Minneapolis, Minn., Jan. 24—The annual meeting of the Minnesota Automobile Association was held in St. Paul Wednesday evening and was attended by representatives of twenty-two clubs of the state. Preceding the business meeting, the delegates were guests of the St. Paul Automobile Club at a dinner. Reuben Warner, who has been president of the St. Paul organization for the past 3 years, was unanimously elected president to succeed Frank M. Joyce, who has served 3 years, but who declined re-election. The other officers chosen were Dr. J. A. Gates, of Kenyon, first vice-president; J. H. Riheldaffer, of Minneapolis, second vice-president, and L. A. Wood, of St. Paul, secretary and treasurer. During the year the membership of the association has increased from eight to twenty-six clubs, with five others awaiting admission. The Red Lake Falls club, with fifteen members, was voted to active membership. The treasurer's report showed that the balance on hand amounts to $843.33. It was decided to expend $500 in sign installation with such clubs as appropriate an equal amount for carrying on the work. The association again will hold a reliability contest. Among the other matters discussed was that of securing uniform ordinances in every village and city which shall conform to the provisions of the state law. A resolution indorsing the federal law now before congress and urging the Minnesota delegation to support it was passed. Personal contributions from members to aid the work of the national legislative convention, which meets at Washington, February 15 to 17, to secure the passage of such a law were also urged by the various speakers at the meeting.

Lozier Will Construct Motor Car Plant in Detroit

Detroit, Mich., Jan. 25—Rumors which have been in circulation for some time past to the effect that the Lozier Motor Co. would erect a factory in Detroit were confirmed yesterday by H. A. Lozier, who has been in the city for the past week. All the details were arranged and the contract signed in New York last week, those interested with Mr. Lozier being prominent business men and capitalists of Detroit. The eastern plant of the Lozier company, which represents an investment of $1,000,000, has for the past 2 years been working to its fullest capacity. The demand for the Lozier car had made extensive additions or new factories imperative, and for this reason the proposition to furnish Detroit capital with which to build a local plant, was accepted. One million dollars was required for these extensive additional facilities. The report of the committee which for the past 2 months has been looking into the affairs of the Lozier company was of such a nature that the amount required was considerably oversubscribed, it is said. This new deal results in a $2,000,000 company.

Plans for the new factory are being prepared, and work on them will be commenced before March 1. It probably will be late in the summer before the first Lozier car will be turned out from the Detroit factory. In the meantime the eastern factory will continue to work to its fullest capacity to take care of orders and contracts in hand.

The personnel of the Detroit capitalists who have joined the Loziers is of interest. Among the subscribers are the following:

Gilbert W. Lee, E. D. Stair, Charles E. Warren, Cyrus E. Lothrop, David C. Whitney, L. H. Jones, Charles H. Hodges, Charles Stinchfield, George G. Booth, A. H. Buhl, Willis E. Buhl, Charles Cotting, Daniel Wells, C. G. Edgar, Henry L. Lyster, David D. Cady, F. R. Hathaway, H. A. Douglas, Alson S. Brooks, M. R. Snow, Roy E. Pingree, E. W. Pingree, Lawrence D. Buhl, J. Harrington Walker, Horace Havemeyer, R. Adlington Newman, Fred O. Paige, Sherman L. Depew, Cooper Wood, A. B. Wetmore, E. M. Mancourt, H. H. Sanger, W. H. Ball, W. H. Miller, A. F. Peck, E. H. Jewett, F. M. Aiken, W. Brooks, Herbert L. Lord, Charles A. Rathbone, H. M. Jewett, M. L. Williams, Benjamin S. Warren, Mary S. Barry, Frank Hamlin, W. T. Barbour, Rufus W. Clark, John N. Patterson, Harry Skillman, George Treble, Hazel Pingree Depew, L. S. Trowbridge, Jr., Murry Sales, Anna A. Woolley, George H. Woolley, Henry L. Walker, Albert H. Schmidt, C. B. Culbertson, James D. Standish, L. C. Waldo, John H. Wendell, Stanley Brooks, George H. Renaud, W. A. McWhinney, Buel Wetmore, George H. Barbour, E. S. Barbour, George H. Barbour, Jr.

The general offices of the company, now located in New York city, will be removed to Detroit on the completion of the new plant.

The Loziers have been prominently identified with manufacturing enterprises for the past 20 years. Their most conspicuous and well known production was the Cleveland bicycle, made in factories at Toledo, Ohio; Westfield, Mass.; Thompsonville, Conn., and Toronto, Ont. A few years after the bicycle business was disposed of the Toledo factory became the home of the Pope-Toledo car.

Glidden Trophy Retained; Tentative Tour Route Made

New York, Jan. 25—The meeting of the contest board of the American Automobile Association, which was held today, resulted in the decision to retain the Glidden trophy and to make it the chief prize in the association's annual endurance run. This decision was made because of a change of heart on the part of some of the makers who expressed themselves as anxious to retain the trophy which the A. A. A. decided to withdraw from the national tour competition. Undoubtedly the sportsmanlike action of Mr. Glidden had a lot to do with its retention. When approached by the A. A. A. regarding the withdrawal of the trophy, Mr. Glidden declared the A. A. A. could do anything it wished with the trophy—he was willing to abide by any decision it might make.

At the same time that the contest board decided to keep the cup, it also made tentative plans for the annual tour. It is almost certain it will start in June, 2 weeks earlier than usual, and that it will not be over 2 weeks' duration. There will be rest days on Sundays and there will be a ½ hour noon stop each day in some prominent city or town. The tour undoubtedly will start from Cincinnati and end in Chicago, the route of 2,200 miles being through territory never before touched by the A. A. A. tour. The tentative route is as follows: Cincinnati, O.; Louisville, Ky.; Nashville, Tenn.; Memphis, Tenn.; Little Rock, Ark.; Dallas, Tex.; Oklahoma City, Okla.; Wichita, Kan.; Topeka, Kan.; St. Joseph, Mo.; Des Moines, Iowa; Cedar Rapids, Iowa; Davenport, Iowa, and Chicago.

WANTS OUTDOOR SHOW

Detroit, Mich., Jan. 25—Detroit motor car manufacturers to a considerable number have celebrated their return from the New York shows by digging out of the moth balls, where the proposition had been in obscurity for the past year, the project to inaugurate in Detroit in August an open-air motor show, at which the buyers of the country might have an opportunity of looking over the complete lines of the various local factories for the ensuing year. The project was first broached a year ago, but at that time it was proposed to transfer to Detroit the so-called national shows, eliminating the latter altogether. It was found that great difficulty would be experienced in securing a sanction for such an event and the matter was dropped. It now has been revived with a different purpose.

The proposition now is for an informal gathering of the Detroit and Michigan manufacturers at the state fair grounds, just north of the Detroit city limits. The manufacturers will be invited to send as many cars as they see fit, with whatever demonstration corps may seem advisable. Quarters will be assigned in the large buildings of the Michigan state fair which will be available for the purpose, and a fine track will be at hand for testing purposes. Here, it is proposed, the dealers may come and look over the various models. The sales managers of the various concerns will be present, of course, and contracts for the ensuing year ratified when the dealer has been convinced. The consent of a considerable number of the manufacturers has been secured and a thorough canvass is now in progress.

OVERLAND PLANT TO ELMIRA

Toledo, O., Jan. 22—The Willys-Overland Co. continues to expand its manufacturing operations. The latest move was a few days ago when a factory building was purchased at Elmira, N. Y., at a cost of $22,000. The new plant will be used to turn out from 6,000 to 10,000 Overland parts, which will be shipped from that point to Toledo, where the machines are assembled. The Elmira plant will furnish employment for about 300 men, and this number will be increased a little later. This last move was made in order to enable the company to turn out the 20,000 cars planned for the season. In a recent interview Mr. Willys said: "We will ship 12,000 machines from the Toledo plant and 8,000 from Indianapolis. We have been delayed a little because of the fire in the body plant of the Racine Mfg. Co., at Racine, Wis. There are 2,700 men now employed at the Toledo plant, and there will be 3,000 workmen there by February 1. We have taken on 300 hands in the last 2 weeks. While we are only shipping from fifteen to twenty cars daily, we are making parts for from forty to fifty, and when we get our assembling scheme working properly we will ship from fifty to seventy-five cars every day. The Elmira plant just purchased makes automatic screw machine parts."

COMING MOTOR EVENTS

JANUARY

17-31—Philadelphia show.
24-29—Show at Portland, Ore.
24-31—Show at Washington, D. C.
24-29—Ninth annual Detroit show.

FEBRUARY.

4-6—Mardi Gras track meet, New Orleans.
5-12—N. A. A. M. show, Chicago Coliseum.
6-14—Independent show at Los Angeles, Calif.
14-19—Show at Hartford, Conn.
14-21—Show at St. Louis, Mo.
14-18—Annual show at Buffalo.
19-26—Annual show at Minneapolis, Minn.
19-26—Show at Newark, N. J.
19-26—Inter-mountain show, Salt Lake City, Utah.
19-26—First Cleveland show.
19-27—Licensed dealers' show at Los Angeles, Calif.
21-26—Show at Binghamton, N. Y.
21-26—Annual Cincinnati show.
21-27—Omaha show.
22-27—Milwaukee show.
24-March 3—Canadian motor show at Toronto.
28-March 5—Kansas City Automobile Dealers' Association's show.

MARCH

5-12—Second Cleveland show.
5-12—Boston show.
21-28—Denver Motor Club show.
26-April 3—Sportsmen's show at Montreal.

Three Speedway Schemes Sprung in Windy City

Chicago, Jan. 24—If all of Chicago's speedway plans materialize there will be more motoring ovals in operation in and around Chicago this year than are found in the whole United States at the present time. Chicago has the speedway bug for fair and right now there are three propositions up for consideration, although it must be admitted that none of them has as yet assumed tangible shape. It is mostly all gossip with mysterious hints and whispers to add to the excitement and it would seem as if Chicago will be lucky indeed if one speedway is the result of all the talk.

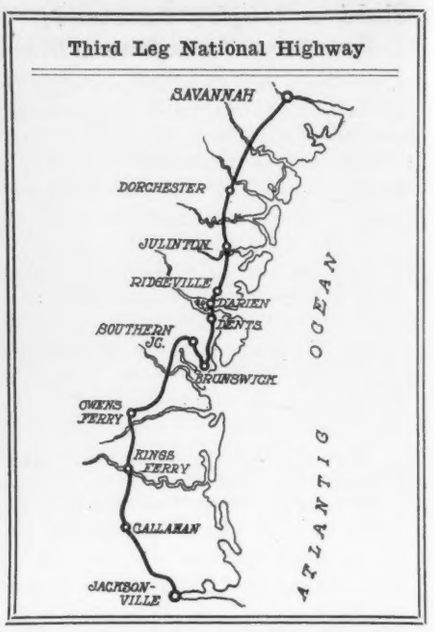
The Chicago Automobile Club is the one promoters are seeking to interest and two of these propositions now are before the board of directors of the organization that so successfully promoted the Cobe cup and Indiana trophy races last year, while the other consists of a circular letter that is going the rounds, which was written by a local iron and steel merchant, who seeks to interest others in his scheme to build a big motor race track.

The first proposition offered to the Chicago Automobile Club is said to have in mind a location in Indiana—some say the old Roby race track—and this has been thoroughly discussed by the directors who seem to be impressed with the seriousness of the promoters. It is desired that the Chicago Automobile Club scratch the Cobe cup as a road contest and make it a speedway event. The club itself would not be financially interested in the speedway, only in the promotion of the Cobe cup race. At that it would not have to take any risks and so it seems possible that if this track is built the club will agree to run the Cobe cup on it.

The second proposition developed only last week and is somewhat similar in character to the first one. However, greater secrecy is observed concerning this one and President Cobe has been pledged to keep quiet as to the location of the track, not even telling any of the directors. He is mildly enthusiastic over it, declaring that the site has unexcelled transportation facilities and is within easy riding distance of the city. While there is nothing tangible concerning this second site, a surmise is made that it is to be located west of Chicago, some thinking that it will be near Elmhurst, basing their belief on the fact that the Northwestern railroad recently has been purchasing a big tract of land in that vicinity.

The original Chicago speedway scheme seems to have died a natural death. That had nothing to do with the Chicago Automobile Club and it was said at the time that it was to be within 25 miles of Chicago on the Northwestern road. Maybe it is the same one that was sprung on the Cobe organization last week, but no one will be positive as to that until President Cobe consents to break his silence. Another racing scheme has to do with a meet at Harlem, to be run by a couple of Providence motorists, who are after the track.

ONE OF THE FINE SHELL ROADS IN FLORIDA



The national highway that is being laid out from New York city to Jacksonville, Florida, has been officially surveyed as far as Savannah. The route is divided into three sections—from New York to Atlanta, a distance of 1,062.9 miles; from Atlanta to Savannah, which is 1,285.6 miles from New York city, and from Savannah to Jacksonville, which tentatively is 1,587.5 miles from Gotham. This third and last stretch will not become official, however, until the endurance run of the Savannah Automobile Club, which is set for March. When that event is completed the full national highway will have been laid out and it will be possible for the promoters of the enterprise to stir up enthusiasm in those sections where the highways are not up to the standard desired for so important a route. It is anticipated that most work will have to be done on the third leg, where there are some bad stretches.

LEAVING THE FERRY AT DENT'S ON WAY TO JACKSONVILLE

Third Leg of the National Highway

SAVANNAH, Ga., Jan. 22—Preliminary scouting work which took place this week over the Savannah-Jacksonville route shows that the third and final leg of the natianal highway from New York to Jacksonville is 240 miles in length. This scout was undertaken to blaze a trail for the endurance run to Jacksonville which will take place March 28 and 29. Two Maxwell cars carried the party and the preliminary survey showed the roads to be fairly good. The highways of Chatham and Duval counties were the only ones that approached perfection, and while some of the other roads were in good condition it was held that they will need considerable improvement before they will be up to the national highway standard. The mileage as laid out by this scouting party was as follows: Savannah to Fremont, 27 miles; to Midway, 30; to Eulonia, 51.7; to Darien, 63.2; to Brunswick, 134.2; to Owen's ferry, 177; to King's Ferry, 192; to Dyle, 203.8; to Callahan, 231.5; to Jacksonville, 240.

Although the scouts failed to make the run on schedule time they came close to the mark, rolling into Jacksonville at 8 o'clock in the evening, whereas they were expected to make it by 5:30. The trip, however, was a most enjoyable one, the cars starting from the front of the De Sota hotel, the first stop being made at the old Midway church, which is one of the oldest in this part of Georgia. From Midway to Eulonia the scouts experienced several exciting ventures. The roads were far from good and added to this there was danger occasioned by forest fires. Several times the cars were forced to travel at top speed in order to get through the burning forests safely and it was during one of these rushes that Jacobs, who drove the No. 1 car, went down an embankment and it was some time before the machine could be returned to the road.

On the stretch from Midway to Darien it was clearly apparent that the roads are sadly in need of attention, but notwithstanding this the party made good time to Darien, where the good roads enthusiasts had prepared a hearty meal for the scouts. Here it was necessary to ford the Altameha

The National Highway

	Miles
New York	0
Philadelphia, Pa.	99
Gettysburg, Pa.	219
Staunton, Va.	389.9
Roanoke, Va.	490.9
Winston-Salem, N. C.	616.7
Charlotte, Tenn.	754.3
Greenville, S. C.	871.6
Commerce, Ga.	981.4
Atlanta, Ga.	1,062.9
Madison, Ga.	1,134.1
Milledgeville, Ga.	1,178.5
Louisville, Ga.	1,232.1
Savannah, Ga.	1,348.5
Brunswick, Ga.	1,482.7
Owens Ferry, Fla.	1,525.5
Kings Ferry, Fla.	1,540.5
Callahan, Fla.	1,579.0
Jacksonville, Fla.	1,587.5

CROSS ROADS FOUND NEAR DARIEN BY SCOUTS

AVERAGE ROAD ON SAVANNAH-JACKSONVILLE LEG

Is Laid Out By Southern Scouts

It is the aim of the good roads party to lay out a national highway from New York city to Jacksonville, Florida, which will be a model of its kind and arouse other sections to enthusiasm over improved highways. This idea was not broached until last summer, but once it was sprung on the public it spread like wild fire and resulted in the promotion of the New York-Atlanta reliability tour last fall, a free and easy affair in which the only penalty was for being late at night controls. While the route was being laid out the various cities in the sections through which the proposed highway was to run fought enthusiastically to get on the official route. The result was that where the roads were at all bad they were put into almost perfect condition for the run and the tourists traveled over roads that were almost boulevards from New York city to Atlanta, greatly to their surprise.

river, but this was successfully done under the supervision of the sheriff. The scouts had company as far as the Dent river, several cars from Darien accompanying them that far. As the pathfinders approached Brunswick they were met 12 miles outside of that city by a delegation which was made up of county commissioners and judges. At Brunswick Secretary A. W. Solomon, of the Savannah Automobile Club, presented to the mayor of Brunswick a letter from Mayor Tiedeman, of Savannah, the receipt of which was followed by a toast in honor of the Savannah club and another for Secretary Solomon. The scouts staid at Brunswick for the night and as a result of their stopover there was an enthusiastic good roads meeting held in which the citizens of the town participated, many speeches being made. The result of this is that Brunswick will at once begin the work of improving the roads around that city.

Leaving Brunswick next morning the trail-blazers were accompanied by seven cars filled with Brunswick citizens, the roads to Brookman being in fairly good condition. With some work it would be possible to make the stretch almost perfect, for at Brunswick there are enough oyster shells to pave the highways between the two towns. This will be done at once and it is expected the roads will be in fine condition for the endurance run. It was during this trip that County Commissioner McKinnon, of Brunswick, was injured. The car in which he was traveling at the rate of 30 miles per hour ran into a stretch of soft dirt and the machine skidded into a stump. The commissioner was thrown out and a rib broken.

The scouts did not stop again until Owen's Ferry was reached, where a delay of two hours resulted because the tide had dropped so low that the lighters could not make their usual trips. It was necessary, therefore, to wait for high tide. From this point on to Jacksonville it was comparatively easy going, but it was not until within 5 miles of the destination that the roads became at all good. At this point the travelers were met by three cars from Jacksonville which escorted them into the city.

Waldon Makes N. A. A. M. Report

NEW YORK, Jan. 24—The annual report of S. D. Waldon, president of the National Association of Automobile Manufacturers, is a most interesting one, Mr. Waldon going into detail as to the efforts being made by the N. A. A. M. to secure the passage of the federal motor bill. He also tells of the good work accomplished by the legislative committee. Discussing the financial condition of the association, he announces a profit of more than $10,000 on the Atlanta show, while the 1909 Chicago show receipts for admission were about $10,000 in excess of the 1908 exhibition. The work of the traffic department also is reviewed. Mr. Waldon's report is as follows:

"In an endeavor to emulate the excellent example set by its predecessors in office, the executive committee has, during the past year, carried on the work of this association in a manner which, judged by results, I am pleased to believe has proven satisfactory. It may occur to you, during the reading of this report, and may possibly have occurred to you before, that little prominence is given to this association in the public prints and elsewhere, in connection with the work to be described to you. The reason is that your executive committee has not deemed it advisable for a manufacturing organization to appear too prominently in connection with legislative matters, or more than mildly active in good roads agitation.

Aid From the Farmers

"It has been customary in times past to believe, and is even now believed by a great many, that it is a mistake to expect assistance from the farmers in such matters as road improvement agitation or the national registration of motor cars. That this help may properly be expected, and is in fact actively accorded us, is conclusively shown by the attitude of the National Grange and by the actions of individual farmers. There is every reason why this should be so. Farmers are purchasing motor cars in greater numbers than the trade realizes. An investigation recently made indicates that 36 per cent of the totol number of motor cars in one of the western states are in strictly country districts, that is to say, in and about towns of less than 3,000 population. And this despite the fact that, while the entire trade is engaged in the solicitation of city business, only a few makers have gone after the farmers, and even in those cases all the work has been done in the past 3 years. It is natural, perhaps, that most of the cars in the country districts are the cheaper models, but this does not alter the fact that the farmers are buying motor cars freely, and that the promotion of good roads is with them, as with us, a matter of self-interest. One of the dealers in Minneapolis says that in 1909 80 per cent of his cars was sold in the country; an implement house places its percentage at 90, while one of our members shows that up to September 1 65 per cent of its cars went to farmers.

"You will recollect that this association was responsible for an arrangement under which its good roads matters are now conducted by the National Grange. The work is carried on under the direction of a central finance committee of three members, all of whom are members of this association. It has been energetically prosecuted during the year, and substantial progress has been made. This committee was originally formed for the purpose of assisting to secure federal appropriations for aiding the states, but conditions rendered it advisable that the movement should include the promotion of legislation adopting the policy of state aid by those states having no state highway commission, and making increased appropriations by the states in which that policy is in force. The chief objection raised against the proposition for federal aid has been that the states having much the larger mileage of roads have no highway commissions for expending their share of such appropriations. To meet this objection it became necessary that movements should be undertaken in all the backward states to secure the establishment of efficient highway commissions, so that in appealing to congress for aid these states can show that they have the requisite machinery.

"Action was therefore taken to extend the educational work so as to create a public sentiment among the farmers of states in which propositions for state aid legislation were pending, with the result that several states have either created highway commissions, or have adopted constitutional amendments making possible the establishment of state aid systems. Tennessee, Georgia, South Carolina, Nevada, Wyoming, Kansas, Kentucky, Florida, Mississippi, North Dakota, Montana, Alabama, Indiana, Texas, South Dakota, Wisconsin, Oklahoma and Nebraska have no highway commissioner; make no annual appropriation for road construction or maintenance; have issued no bonds for this purpose, and have no system of state roads. Kentucky and Wisconsin have recently amended their constitutions so as to provide for state aid, and legislation for this purpose will be enacted at the coming sessions of their legislatures.

Some States Are Slow

"In addition to the states which have no state highway commission there are a number which appropriate such small amounts that their assistance is of practically no value. For instance, Iowa makes no appropriation beyond the salaries of the board of road improvement. Illinois appropriates only $50,000 annually. North Carolina makes only a trifling appropriation. Colorado expends only $75,000 and Utah only $50,000 per year. In fact, with the exception of about ten northern and eastern states the appropriations are inadequate. We are therefore planning to utilize the state granges for the purpose of securing larger road appropriations, and the work has already been commenced. The educational campaign for federal aid has been extended to practically every farming district, with the result that the farmers now unanimously favor legislation creating a national highway commission and making liberal appropriations.

Follow New England Idea

"The past year has also witnessed the development of what is known as the New England plan for connecting trunk lines of highways. This is a comprehensive plan for the construction of continuous lines of roads by the six New England states, touching all the principal centers of each state and connecting with similar roads at the boundaries of the adjoining states. The suggestion for these connecting lines was first made at a conference of New England governors held in Boston about a year ago, and was taken up with the state granges of the six New England states, by George S. Ladd, special good roads lecturer of the National Grange, who was able to enlist the active co-operation of those organizations, with the result that about $4,000,000 was appropriated by the legislatures for the construction of connecting state highways. Legislation will be urged at the coming sessions of the legislatures of several of these states making additional appropriations which will result in giving this large section a complete system of connecting improved roads. Similar plans for main lines of state highways have been prepared for other states, such as New York, Virginia, West Virginia and Washington, and it is our intention to advocate all the states shaping their policies along these lines.

Expenses Are Large

"The funds to meet the expenses for printing of the immense number of pamphlets, speeches and other articles, postage, clerk hire and salaries and traveling expenses of the parties engaged in carrying on this educational work have been furnished in part by this and other associations, and by subscriptions from individual manufacturers of motor cars and others interested in the success of this movement. Contributions are being solicited from the manufacturers of motor accessories, road-making machinery, road oils, etc., and it is believed that the amount necessary to continue this work will be secured from these various sources.

"The work of your legislative committee has been directed mainly along four lines:

"First—To secure the enactment into law of the federal registration bill, to the end that a license to operate motor cars,

Makers Help the Motorists

good, for example, in New York, should be equally good and effective in San Francisco, and at every intermediate point.

"Second—To accomplish the enactment in all the states of a uniform state motor vehicle law. It would seem to be sound to say that what would be an adequate motor vehicle law for one section of the country would be equally adequate for any other.

"Third—To deal with the situation in New York state as the contingency from time to time might require.

"Fourth—To assist the motorists in various parts of the country to prevent the enactment of hostile and unreasonable legislation. The committee has been able to make distinct progress and to secure gratifying results in these respects. These may be detailed as follows:

Educational Work Done

"The 2 years' educational work which has been done in behalf of federal registration is expected to bear fruit at the present session of congress. An extraordinary attempt is to be made to secure the passage of the bill through the co-operation and support of the measure by the American Automobile Association at its national legislative convention to be held at Washington on February 15, 16 and 17, one of the two main purposes of which convention is to gather together all the influences in support of this bill, and present the arguments both of popular demand and of legal citation in behalf of its provisions. A letter, stating the plan in brief, enclosing a statement of the work accomplished in connection with nine countries of continental Europe in securing a universal registration, and urging immediate action in support of the movement, has been sent to 25,000 motorists. A brief, prepared by this association's counsel, is being printed for distribution to the same number of motorists.

"To every one of the legislatures which held a session in 1909, and to every one of the legislatures which is holding a session in 1910, your committee has sent, through its accredited representatives in the various states, a draft of the proposed uniform state motor vehicle law, with a statement of the arguments and reasons in support of it, and through its counsel has kept in touch with the motorists in the respective states, advocating the adoption of the measure, and has, from time to time, advised them, encouraged them, and furnished them with arguments or answers to opposing arguments. How effective this work has been will be demonstrated by a glance at the changes in the state motor vehicle laws effected at the last sessions of the various legislatures. In many states there were enacted into law the substantial provisions of the uniform law advocated by this association, and in some states the proposed uniform law was adopted almost in its entirety.

"The association has been called upon to deal with some twenty different proposed motor vehicle laws introduced into the legislature of New York at its session in the last year, and was finally encouraged to prepare a law of its own. In the progress of this law in the legislature it met with the usual attempts at amendments, some of which were engrafted upon it, and in the end, after the bill had been almost unanimously passed by both houses of the legislature, it nevertheles retained many of the substantial provisions of the act which we had proposed, although in some other respects it was altered. The bill was eventually vetoed by the governor, chiefly because it was understood to contain provisions which might interfere with the traffic regulations of New York city. There was no intention in the provisions of the bill to so interfere with the traffic regulations, and it is at least doubtful whether such would have been its effect, but we were and are as eager as any one could possibly be not to leave the slightest room for doubt in that regard.

"In not a few instances aid has been rendered to the motorists in special troublous circumstances, peculiar to their particular jurisdiction or locality. It worked with the motorists of Bar Harbor in connection with a bill introduced into the legislature of Maine authorizing the three towns on Mount Desert island to enact ordinances excluding motor cars from their confines. As a result, although two of the towns availed themselves of the privilege granted by the legislature, the third town, which really holds the key to the situation because motor vehicle users having access to it are obliged, in order to secure ingress to it and egress from it, to pass through and over the roads of one of the other towns to reach the main land, made the law practically a dead-letter. To that extent it would seem that the statute would be of little or no effect. Drafts of the essential provisions of acts and ordinances have been prepared and sent to the organized motorists in Hunting, W. Va., of Chattanooga, Tenn., of Richmond, Va., and other places throughout the country.

Looking After Finances

"During the early part of the year the financial affairs of the association were given most careful thought. The added expense which the association had taken upon itself, particularly that made necessary by the proper organization of the traffic department, made it evident that reasonable economy in the administration of the association's affairs would be necessary. It is pleasing under these circumstances to observe, as you will observe from the detailed report to be presented by your treasurer, that there is a substantial increase in our surplus, as compared with that of last year. This is due to three facts: First, that the income from the Chicago show was greater than in any previous year; second, that a number of members have been added to the list, each of which has paid $500 initiation fee, and, third, that the association has received from the Atlanta show a profit of $10,000 with a small amount still to come.

"The annual national show at Chicago last February was in every detail the most successful yet held under the auspices of the association. It was impossible that there should be a greater number of exhibitors than at the shows of 1907 and 1908 from the fact that all possible space had been utilized for several years. Due to the increased public interest, however, the receipts from admissions were about $10,000 in excess of those of the show of 1908.

N. A. A. M. Traffic Department

"On the day of our last annual meeting your president reported that a traffic department had been organized, the privileges of which had been extended to members of the Association of Licensed Automobile Manufacturers and the American Motor Car Manufacturers' Association. The department was not at that time sufficiently advanced to have been able to accomplish extraordinary results, but its activities during the last year have resulted in extraordinary benefits to the industry.

"There has been a marked tendency on the part of railroads during the past year to increase freight rates on all articles and commodities. In the past few months they have directed their efforts with particular force toward motor car ratings. Serious advances, which would have added an immense amount annually to the cost of deliveries, have been prevented only through the effective organization and activity of the traffic department. Notwithstanding these conditions, we have, on the other hand, secured very important reductions. The general work of the department has developed and increased in furnishing information to factories and dealers, the preparation and handling of claims, auditing freight bills for overcharges and gathering data covering the industry as a whole, to determine its proper status with respect to freight rates and transportation facilities.

"The department is in touch at all times with the railroad traffic managers and rate-making committees in the protection of our interests. Data is not available to show the exact amount of money involved in the various proceedings where the industry was represented by the traffic department, but an idea of the importance of this work may be gathered

from the fact that figures based on a reasonable estimate of shipments from the factories for 1910 show that had we not successfully opposed the proposition for a 25 per cent increase in the freight classification of motor cars on railroads east of Chicago $500,000 to $1,000,000 per year would have been added to the cost of shipping them.

"Very large sums in each case were also saved through our action in having an advance of 33⅓ per cent in carload rates to the Pacific coast rescinded; through the defeat of a proposed 20 per cent increase in the weight charged for 36-foot cars in the territory between Buffalo and Chicago, and reduced ratings secured on railroads east of Chicago to apply on motor cars in less than carload lots, the reductions amounting on small machines to 40 per cent. In the same territory motor car engine and gear part less carload ratings have been reduced 12 per cent to 15 per cent. Rates on carload lots to Texas have been reduced from $5 to $50 per carload. The cost of shipping single machines from factories in Indiana, Illinois and Wisconsin to southern points has been reduced about $15 each.

New Freight Cars Built

"We have continued to keep before the railroads the necessity on their part of increasing the number of freight cars with door openings suitable for motor cars, so that during the year 13,207 such cars have been ordered or built by them. The traffic department rendered valuable service in this connection by investigating the varying requirements of factories located in different parts of the country as to the kind of freight cars needed by them, size of doors, etc., and placing before the railroads a circular wherein these views were harmonized so that railroads could build cars satisfactory alike to all factories.

"The National Industrial Traffic League is an organization of traffic managers throughout the country, and, as chairman of its committee on transportation instrumentalities, our traffic manager has been in position to render direct and valuable service to the motor car industry through concessions secured in the minimum carload weights applied on freight cars 40 feet and more in length. By this, for example, 10 per cent has been taken off the freight on hundreds of shipments in 40-foot cars.

"Renewed applications during the year on the part of Canadian railroads to the Canadian railway commission for its approval of advanced ratings on motor cars we have opposed successfully.

"During the year the traffic department made 356 claims against railroads for the account of members, in the amount of $4,060.05. Cash collected during the year was $3,969.67. We now have outstanding

in course of collection claims to the amount of $3,032.72. Most of these claims are the result of our checking freight bills covering supplies received at factories, and involve experience and considerable labor. By handling freight bills in this way we have also been able to suggest to the factories routing and shipping methods to their advantage. We invariably save money for dealers who use the department by having their freight bills covering shipments of motor cars from the factories audited by us, and the indications are that the claim account will be considerably increased in that way from now on. Some claims involved informal proceedings with the interstate commerce commission whereby refunds were secured on specific shipments brought to our notice. We have recently investigated the extent of express business to and from the factories, and our figures indicate that considerably more than $500,000 per year is expended in that direction. We are going into this thoroughly, hoping to find a means of reducing the rates charged the factories by express companies. In addition to this work, the traffic department undertakes the checking of freight bills and the preparation and prosecution of claims for overcharges and damages not only for the members of the three associations but for any of their dealers who care to take advantage of the association's facilities. The executive committee made an endeavor to make the department self-supporting by making a small charge for these services, that is to say, by deducting a small percentage of the amounts collected. The plan was not received with general favor, however, and was therefore abandoned.

"Ten active members have been added to the roll during the year. They are: M. Grabowsky, Rapid Motor Vehicle Co., Pontiac, Mich.; R. B. Jackson, Hudson Motor Car Co., Detroit, Mich.; W. C. Marmon, Nordyke & Marmon Co., Indianapolis, Ind.; S. H. Mora, Mora Motor Co., Newark, N. Y.; Frank Briscoe, Brush Runabout Co., Detroit, Mich.; W. C. Johnson, Waverley Co., Indianapolis, Ind.; W. H. Van Dervoort, Moline Auto Co., East Moline, Ill.; R. H. Salmons, Selden Motor Vehicle Co., Rochester, N. Y.; W. S. Austin, Austin Automobile Co., Grand Rapids, Mich.; W. C. Anderson, Anderson Carriage Co., Detroit, Mich."

Birmingham Motoring Center

BIRMINGHAM, Ala., Jan. 24—In all the south there is perhaps no city showing greater appreciation of the worth of motor cars than Birmingham. During the year 1909 the value of cars owned by people of Birmingham has increased by at least $500,000 over values for 1908. These figures are arrived at by placing the value of each new machine brought to Birmingham at $2,100, figures that are used after conservative estimating based on reports from the twenty or more selling agencies in Birmingham. In the year 1909 the city license office issued 522 licenses as against only 278 issued in 1908. These figures show an encouraging increase of nearly 100 per cent in one year's time. In 1907 there were fewer than 100 cars registered in the city of Birmingham. The increase in 2 years therefore being over 500 per cent. As indicative of the opportunities for car selling these figures are without compare. For the year 1909 the city's increment from the sale of licenses was $4,184, while for 1908 it was but $1,946, the figures showing an increase of $2,238 in revenues from this source. This large increase in ownership of motor cars has brought the general interest in motoring to a high state in Birmingham and Jefferson county and the impetus to road-building from the use of motor cars is, perhaps, unequalled by any other section of country in America. Last October the Birmingham Motoring Club ran a pathfinding tour to Atlanta, Ga., for the purpose of blazing out a trail, the ultimate object being to discover the most feasible route for a road between the two great southern cities to finally connect with the projected south and north national highway from New York to Atlanta. During this tour the roads of Cleburne, St. Clair and other counties were traveled and the citizens of each were given an object lesson illustrating the urgent necessity for good roads that has since led to the voting of bonds by many counties for the improvement of their roads. The Birmingham Motoring Club is composed of practically all of the owners of Birmingham and vicinity. J. E. Denman is president and J. Z. Brazzellton is secretary. Since the inception of this, the first motoring club in Alabama, other motoring clubs subsidiary to it have been organized in Montgomery, Mobile, Anniston and Tuscaloosa.

BENZ-FIAT MATCH RACE

New York, Jan. 24—George Robertson, driving the big Benz in which Hemery established several short-distance world records on the Brooklands track in England, will meet Lewis Strang, driving the Nazzaro Fiat, in a match race on the Atlanta speedway the latter part of February. This match is made as a result of the challenge of Jesse Froehlich, of the Benz Auto Import Co., who offered to back the Benz against any other car in the world for $10,000. This challenge produced a reply from Edward Platt, manager of the Atlanta speedway, who offered a purse of $5,000 for a series of races between the Benz and the Fiat. Strang and Robertson have agreed to drive three heats of not longer than 10 miles each, each driver to receive $1,000 appearance money and the owner of the winning car to get the remaining $3,000 and a cup.

Model Roads at Montgomery

MONTGOMERY, Ala., Jan. 22—Boasting 336 miles of improved public roads, of which 245 miles is macadam road treated with gravel and sand clay, Montgomery county, Alabama, offers an inviting field for motoring. The city of Montgomery proper has many miles of paved street roadways which rank with the best in the country, regardless of the size or importance of the city. The road system of Montgomery county follows a definite plan of radiation from Montgomery city, the county seat, to many points on the county line in many cases distant from 20 to 35 miles. Cross intersecting roads connect many of the main roads, making it possible to reach by macadamized roads almost any point in the county.

The sand clay material used on many roads in the county is a material peculiar to Montgomery county, being a semi-clay substance containing much sand, the whole held together by the natural binder qualities of the tenacious clay. It makes a road surface unexcelled even by asphalt, and its only defect is a dust that rises in dry weather. Even this is, however, not a bad fault of the material and does not develop to a serious extent.

The road improvement work of Montgomery county properly began 15 years ago, when the first bond issue was authorized and a definite plan of road work was adopted. Since that time $825,000 has been spent by the county on its roads, resulting in a system that is to become a model. Recent legislation makes it possible for the counties of Alabama to use convict labor in road work, a possibility heretofore not open, and a recent purchase of prison cages and other road-working paraphernalia for the use of convicts is an indication that this county will use its convicts on the roads beginning with January 1, 1910. In fact, the county board of revenue has announced recently that such will be its policy in the future.

Part of the general plan of highway improvement of the county is the replacement of all wooden bridges throughout the county by concrete structures, and three such bridges already have been built; one spanning 30 feet, another spanning 35 feet and the third 60 feet. In addition to this work concrete culverts are being built along the roads everywhere to replace wood and brick.

The county annually spends in excess of $75,000 in road-building and road-maintenance. This annual expenditure, together with the use of convict labor, ultimately will result in the macadamizing of every mile of the total 650 miles of public roads in Montgomery county.

Recently two government road experts were in Montgomery inspecting the county roads and when their work was complete they had nothing but words of praise and admiration for what they had seen. These experts, J. H. Dodge and F. H. Brown, declared that they found the roads of Montgomery county to be the finest they had inspected after a trip through the entire country.

"I have travelled over many miles of roads in every part of America," said Mr. Dodge, "and I have built many roads myself, but the construction of the Montgomery county roads cannot be excelled, and they are up to the standard, to express it mildly. The roads are constructed of well-wearing material, and they stand up splendidly under the traffic that goes over them."

In the city of Montgomery there are four garages for the keeping of cars, all of them doing a good business, while five concerns sell from stock or act as selling brokers for several of the highest-class cars in the American market. The city of Montgomery has issued licenses to owners of 300 cars, while at least 100 more are used in the county, making a total of 400 motor cars in use in Montgomery county.

These facts testify to the rapid awakening of the citizens of Montgomery county and the city to the usefulness of motor cars and the trade seems to be on the increase if reports from the dealers are to be believed. The splendid condition of the roads of the county make it possible to get the greatest possible amount of enjoyment from a motor car and the trade seems to be benefiting from numerous articles appearing in print praising the highways.

Four adjoining counties recently have sold bonds aggregating $750,000 for the improvement of their public roads on the same plan as Montgomery county, and the completion of that work will make this section of Alabama about the cradle of the confederacy one of the finest motoring districts in the world. Pike county, to the south of Montgomery, already has expended $250,000 on its roads and the recent completion of a road in that county running from Troy to the Montgomery county line and connecting with the Montgomery road makes it possible to drive from Troy to Montgomery after luncheon in time to see an afternoon's game of Southern league baseball.

DEMANDS IMPROVED ROADS

Indianapolis, Ind., Jan. 24—At the thirtieth annual meeting of the Indiana Engineering Society, held in this city recently, the creation of a state highway commission to care for the construction and repair of all roads in the state was proposed by C. A. Kenyon, a paving engineer and motorist. In the course of an address on construction Mr. Kenyon said:

"Something must be done to bring about a better uniformity in the construction of roads in Indiana and it could not be better done than through the creation of a public highway commission, which would have charge of all roads in the state and under whose jurisdiction all road building and road repairing would be done. The rapid increase in the number of motor cars in use in Indiana makes it necessary for the state to give more attention to its roads, for it is estimated that a motor car wears down a road five times as rapidly as another vehicle. We have no good roads in Indiana now.

"They cannot compare with the roads in Europe, where the state has charge of the road building and repair work, and where the roads are kept in perfect condition. Because they have good roads in England they are using many enormous motor tractors on the country roads to haul freight from place to place. These are huge motor cars. In the main car a load of 10 tons is hauled, while in a trailer 6 tons or more of freight may be hauled, making a load of 16 tons. Where are the roads in this state that could stand for long such wear as this? Before a great while you will see similar machines on our roads, and then where will we be with our roads? We have got to get ready to meet these conditions. Of that I am certain."

An interesting report was made by Melville W. Mix, a millionaire manufacturer of Mishawaka, secretary of the society. "The manufacturing situation in Indiana in 1910 will be the banner year of the state," he said, "and the motor car industry is the coming industry of Indiana in my opinion."

FRANKLIN MANAGERS MEET

Syracuse, N. Y., Jan. 24—The quarterly conference of the branch managers of the Franklin Automobile Co., which has branches in eleven cities of the United States for the sale of Franklin motor cars, was held at the factory of the H. H. Franklin Mfg. Co. In the sessions of the first day addresses were given by Assistant General Manager T. R. Lippard, of the Franklin Automobile Co., and Assistant Superintendent G. D. Babcock, of the manufacturing company. A trip through the factory was made for the purpose of showing the representatives some of the labor saving devices and machines for securing accuracy in Franklin parts. There were discussions of prices, trade conditions, the disposal of second-hand cars and other subjects. Selling demonstrations were given by several of the men, one manager acting as salesman and another as customer. In the evening J. D. Kenyon, vice-president of the Sheldon School of Salesmanship, gave a talk on "The Science of Salesmanship." The second day Engineer Arthur Holmes talked before the men on the materials used in a Franklin motor car, and R. A. Vail spoke on the Franklin system of inspection and tests.

The Readers' Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

DEFENDS RIGHT-HAND CONTROL

LINCOLN, Ill.—Editor Motor Age—Some time ago an article was published in Motor Age arguing in favor of left as against right-hand drive, giving in support of this contention two main reasons, namely: 1—That in passing on the right, as is customary, the driver could better judge his distance from the other vehicle. 2—The advantage of having the passenger, who is in the front seat, next to the curbing when entering or leaving the machine. In many of our western states the tourist now finds most of his trouble and worry occasioned not so much from the passing of an approaching vehicle as from the passing around of an overtaken and slower moving vehicle. In the first case the driver of the approaching vehicle is compelled to do his share of the turning out, whereas in the latter case the man behind must do all the driving and passing. In numerous cases where the roads are narrow and rough, the getting around another vehicle is not an easy matter and here, of all places, a driver desires to be on the side next to the vehicle in order to see that he is not getting too close, as he cannot expect very much road when overtaking and passing the average western farmer who can see no reason why he should pull out a little and give the motorist a fair chance to get by. This advantage can be gained only with right-hand drive if the rules of the road are observed. The argument of convenient access to the front seat from the curb does not carry much weight with the tourist, who cares little how he gets in or out, but with town cars, limousines, etc., which are used almost exclusively in the city, this feature will probably be accepted very favorably by many.—Jeff J. King.

CARBURETER GASOLINE CONTROL

Decatur, Ill.—Editor Motor Age—Will Motor Age enlighten me on the following: In Brooke's Automobile Hand Book it is said that "it has been determined from the result of experiments that to get the maximum power at any speed from a gasoline motor equipped with a float-feed carbureter, the jet of the carbureter must have a larger opening for low speeds than for high speeds." If this is true, why does the new Schebler model L open the needle valve as the throttle is opened?—V.

The accepted theory on carburation today is that a uniform, or as nearly uniform as possible, suction must be maintained on the gasoline in the spraying nozzle at the different speeds. On low speeds a greater amount of gasoline is generally required, and this obtained by the adjustment of the needle valve. On high speeds, if an auxiliary air valve is not provided, there will be too much gasoline drawn out of the nozzle, and it is the adjustment of the auxiliary air valve that compensates for this condition. Concerns who use a needle valve in conjunction with the auxiliary air valve have a delicacy of adjustment between the two, and it is because of this that on the model L Schebler the needle valve is raised, it being understood that the amount of lift is determined in tuning the carbureter. We cannot from your quotation conceive the exact type of carbureter the author had in mind. He may not have had the auxiliary air valve design in view when the statement was written.

SUGGESTS A FORMULA

Berkeley, Cal.—Editor Motor Age—I have noticed and read with a great deal of interest the recent discussions in regard to the horsepower of hydro-carbon engines, in both the foreign and American motor journals, and have been greatly interested in the article in the Motor Age on the "Criticism of the A. L. A. M. Formula." In the first place as gasoline is used entirely for motor car work, and this discussion is in regards to this type of engine, the question of using any other kind of gas for the present will not be considered. The so-called explosive, or gas engine, should be considered as a simple chamber or cylinder in which there is placed a mixture of gas and air, the gas in this mixture upon being ignited burns, which heats the air; this heated air expands, forcing the piston or movable end outward or downward. It will be seen that there are two principal actions: First, the amount of gas and air that is introduced into the cylinder, this is controlled by the bore or diameter of the cylinder, and used in terms of the area; and, second, the amount of expansion of the heated air, in the cylinder, which is used in terms of the stroke of the piston.

From this it can be readily seen that there are two essential parts to a gas engine, that must be taken into consideration separately, the area or end section of the cylinder, in relation to the initial charging capacity, and the stroke or the expansion of the heated air in the charge, therefore it should be essential to consider the stroke, as controlling the expansion, in considering the computation of the horsepower of a gas engine. This has not been done by the A. L. A. M. formula, but is supposedly taken care of in basing the piston speed at 1,000 feet per minute, which limits the stroke and revolutions per minute to a given number of piston feet per minute, but does not take into consideration the number of impulses per minute or the expansion of the heated air. The A. L. A. M. method would be all right if the bore and stroke were always of a certain ratio to each other, which is not the case, as the bore and stroke ratios differ very greatly, therefore it should be very essential that the stroke should be taken into consideration.

Moderate practice has been for high-speed engines, 1,800 to 2,000 revolutions per minute, but experience has shown that the practical limit of efficiency places the

STANDARDIZED MOTORS

Chase, Kan.—Editor Motor Age—One scarcely can pick up a motor car periodical lately without seeing a discussion about the design, horsepower, etc., of different gasoline engines and if a subscriber has the nerve to ask any of the publications if a certain motor is equal in power to some other certain motor where bore, stroke, location of valves, shape of combustion chamber—as the many other things that can be and are different in different motors—nine times out of ten one sees that the editor begins to sidestep, explaining that design has something to do with power and talks about manifolds, intakes, etc., etc., winding up by referring the subscriber to the A. L. A. M. rating which "with a piston speed of 1,000 feet per minute" will give approximately the horsepower if the engine is "properly designed." The aforesaid subscriber probably is left as deep in the mud as he formerly was in the mire. Now, if such designers and manufacturers as R. E. Olds, who designed and put out one of the first long-stroke motors as exemplified in his two-cylinder Reo, would tell us why he shortened the stroke proportionately 5/8 inch in his new four-cylinder, or if on the other hand the designers of the Premier or Marmon or the many others who have lengthened the stroke of their motors from slightly to almost an inch, it would make very interesting reading and would give the readers of Motor Age the insight of men of experience. The excuse is offered that it cost time and money to experiment and no one manufacturer can hardly afford to go into an exhaustive test

piston speed at 1,000 feet per minute—this should not be confused with revolutions per minute—and this speed on a 6-inch stroke would give 1,000 revolutions per minute, and above this speed the power of the engine, although increased, is at a diminishing ratio of the power to the revolutions, and that although great power is developed for a short time it is quickly lost or killed and is not a constant power, and is developed at the expense of the engine.

The term horsepower expresses work done by a piece of machinery, and was established by James Watt as the power of a strong horse to do a certain amount of work. This established unit is 33,000 foot-pounds per minute, or the lifting of a weight 33,000 pounds 1 foot in 1 minute, or lifting of a weight 1 pound 33,000 feet in 1 minute, thus it will be seen that we have mass or weight, and velocity or space divided by time, and power or the rate of work.

Comparing this to the gas engine we have mass or the bore area, controlling the amount of gas mixture introduced into the cylinder, and the distance traveled or stroke, these when multiplied together give us the piston displacement, but this term cannot be considered, for in that expression we lose the identity of the ratio of the bore and stroke to the velocity or number of revolutions, which produces the power or work done, also as the expansion of the heated air is taking place driving forward the piston, for a certain distance or stroke, which occupies a certain space of time, and if this is eliminated we cut out one of the most important conditions. Therefore the stroke can no more be ignored than the 33,000 pounds can ignore the distance to be lifted, in the original horsepower formula. From the above formula the indicated horsepower of the steam engine has been derived and is as follows:

$$\text{I. H. P.} = \frac{P \times L \times A \times N}{33{,}000}$$

R. = Mean effective pressure.
L. = Stroke in feet.
A. = Area cylinder, square inches.
N. = Strokes of revolutions in single acting engine.

The mean effective pressure in a gas engine increases at a fairly constant ratio to the increase of the compression, and the compression is limited, by the liability to premature ignition of the charge by the rise in temperature due to compression, this limit is approximately about 90 pounds per square inch, and the mean effective pressure will be approximately 100 pounds per square inch above atmosphere, Groves formula M. E. P. = $2C - 0.01C^2$, C = compression, and then as there is one impulse in every two revolutions in a four-cycle engine, this will give an average of 50 pounds per square inch, then substituting 50 for P in the formula, this can be done as P in the steam engine is variable according to the boiler pressure and the cut-off of the slide valves, then we have the formula:

$$\text{I. H. P.} = \frac{\text{L. A. N.}}{660} \text{ —for one cylinder.}$$

Comparison of the above formula with many indicator diagrams taken from gas engines, was found to tally very closely, and figuring on the mechanical efficiency at 77 per cent due to friction and other losses, we derive the formula:

$$\text{I. H. P.} = \frac{\text{L. A. N.}}{850}$$

which comes very nearly being correct, as comparing this formula with brake horsepower tests made on numbers of different makes of gas engines, it has been found to give results as accurate as the steam engine formula, when the gasoline used is 72° Baume.

This formula corresponds with the formula as adopted by the New York Motor Boat Association, as follows:

$$\text{H. P.} = \frac{\text{A. N. S. R.}}{C}$$

where

A = Area of cylinder in square inch.
N = Number of cylinders.
S = Stroke in feet.
R = Revolutions per minute.
C = Constant, or 850 for four-cycle gas engines.
C = Constant, or 600 for two-cycle gas engines.

From the above formula by transposition, the bore, stroke and number of revolutions, also the piston speed, can be determined separately, when any of the other parts are known. This formula is very simple and easily remembered, and takes into consideration all the dimensions of a gas engine and has been proven to be very nearly the same horsepower as determined by the prony brake, and seems to the writer to be much more acceptable. I should like very much to hear from different manufacturers, as to how the brake horsepower tests of their engines compare with the horsepower as derived from this formula, for this horsepower should be decided and a formula should be used wherein all the dimensions of an engine are taken into consideration.—Charles B. Lewis, Consulting Engineer.

with a view of finding the best, which is true and at the same time a tacit admission that the buying public can pay the expense of experimenting. We have, in this country, two great organizations in the interests of the motor car, that is, the A. L. A. M. and the A. M. C. M. A., and I saw some time ago that the committee appointed for the purpose had decided what kind of screws, bolts, etc., should be used in a car. It occurs to me, that an exhaustive test and experiment of the proper relation of bore and stroke, of valves in the head or in an H or T head was best, or if a conical combustion chamber would give more power than others, or if an offset crank or camshaft was any particular advantage and the numerous other phases of a gasoline engine could be carried on by either or both organizations at a slight expense to each individual member and settle beyond discussion, for a time at least, the many questions that vex the prospective buyer. Now, I do not want to be considered as a kicker, but I feel that all honor and thanks should be given to such men as Selden, Ford, Olds, Kelly, Brush and the many others who have spent time as well as money to give us the mode of travel that gives added zest to pleasure, lightens the burdens of labor, brings our friends who are 100 miles away close home, the city 50 miles away, close to our door, the physician to our house in a hurry when moments are precious, the bloom back to our invalid's cheek and the thousand and one other conveniences and pleasures that only those who have a motor car know. Standardize the motor—that is the heart of the motor car.—Fred L. Willard.

TIMING MAY BE WRONG

San Diego, Cal.—Editor Motor Age—I am having difficulty with my two-cylinder Maxwell, and wish Motor Age would help me. On the level, with closed throttle and advanced spark, the car runs very smoothly, but when I open the throttle, the engine knocks as it gains speed. The knocking ceases if I retard the spark or close the throttle. Consequently, when climbing a hill, I begin the climb with retarded spark and open throttle, and as the car gets further up the hill the spark can be advanced a little without knocking. This knocking only occurs on high. The engine was completely overhauled a month ago and otherwise runs very smoothly. Repairmen have advised me that the only thing to do is to have it overhauled again. —Subscriber.

Your trouble probably is due to the fact that when the motor was re-assembled after the recent overhauling the spark

may have been timed a trifle earlier than previously. There is no reason why you should not retard the spark before subjecting the motor to a hard pull—that is what the spark control lever is for. It may be possible, however, that the cylinders are again carbonized to such an extent that preignition takes place; this might happen if too much oil has been fed to the motor since the overhauling. Then again, overheating may take place, as a result of obstructed water passages; if the old hose were replaced on the motor, it may be that the inner layer of rubber was partly peeled off and frayed in such a manner that it now obstructs the flow of water through the hose. Either of the two last mentioned causes of preignition would be accompanied by a very warm or perhaps steaming radiator after a run of a few miles. If you can get satisfactory service from your motor by manipulating the spark and throttle levers your motor does not need another overhauling; and if you feel that the spark is set too far ahead examine the control rod which is connected to the commutator; it might have been bent during the overhauling process, so that the spark does not occur in the cylinder at the same time relative to the position of the hand lever on the steering column. It also might be well to check up the timing of the valves with the marks on the flywheel. If the valve timing is correct the ignition also is correct as far as the proper meshing of the timing gears is concerned.

NEW STYLE OF CRANKSHAFT

Orion, Ill.—Editor Motor Age—I am thinking of having a four-cylinder four-cycle engine built, with cylinder sizes 4 by 4½ inches. On account of a new valve arrangement I want to have a three-bearing crankshaft with the first and second cylinders on one throw, and the third and fourth cylinders on the other. What disadvantages would this form of crankshaft cause and how could they be overcome?—A Subscriber.

There is no reason why you cannot use a crankshaft of this type and fire 1-4-2-3. You naturally would have to make such a crankshaft considerably stouter, and of larger diameter than where a different arrangement is used. On the new White gasoline car the second and third throws are together, this crankshaft being of the two-bearing type. On the Chalmers cars a two-bearing shaft also is used. In both of these machines particularly heavy crankshafts are made use of.

SHAWMUT HOLDS TROPHY

Easton, Md.—Editor Motor Age—During the summer of 1909 there was a transcontinental run participated in by Ford machines and a machine of another make, the name of which we do not recall. Will Motor Age kindly advise us if the trophy went to the Ford machine; if so, whether or not it remained in the Ford company's possession and if it did not remain in their possession the cause of the withdrawal of same and who was declared the ultimate winner of the contest.—The Shannahan & Wrightson Hdw. Co.

The trophy of this transcontinental race was originally awarded to the Ford car in spite of a protest lodged by the driver of the Shawmut. Some time after the award of the trophy the contest committee of the Automobile Club of America altered its decision and had the trophy given to the Shawmut car, the maker of which now holds it.

WHAT WORM DRIVE IS

Brodhead, Wis.—Editor Motor Age—Through Readers' Clearing House will Motor Age explain what the worm drive is, of which it speaks in its editorials on foreign cars, also foreign spring shock absorber?—John C. Murdock.

If you are familiar with the worm-and-gear steering mechanism of a car you will readily understand the meaning of worm drive, because the situations are practically alike. In the ordinary shaft-drive car on the rear end of the propellorshaft is a bevel pinion which meshes with the bevel gear on the differential; but in the worm-drive car a worm is located on the end of the propellorshaft and meshes with a corresponding gear on the differential. The worm on the propellorshaft is of the same design as that on the steering column. It is understood that the accuracy of the worm construction is much greater than in the case of the steering column, so that the highest efficiency is obtained so that it is reversible with the same degree of efficiency as when driving ahead. The chief value of worm drive is that it is possible to use lower gear reductions and still maintain a small housing for the differential. The clearance of the rear axle can also be increased. The spring shock absorbers of which you speak are what we ordinarily understand in this country as supplementary springs. They are, in brief, double and sometimes triple, short coil springs mounted vertically and interposed between the upper quarter and lower half of a scroll spring. They are also used between the rear ends of semi-elliptics and the frame.

LOOK AT IGNITION SYSTEM

Washington, D. C.—Editor Motor Age—Will Motor Age please advise through the Readers' Clearing House what is the matter with our motor. We have a four-cylinder motor which fires 1-2-4-3. The valves are all ground in tight, the timing seems to be right, and the motor will speed up and run fine on the level or standing still, but will not go up a slight grade; it has no power. It will be running along at about a 15-mile clip, then it will stop firing all at once, then commence firing again. I have put on three different carbureters and all act the same. I adjust them with the throttle open where the motor runs best, and when I throttle down where it runs slowly it will run for a few minutes, then stop. In giving it gas enough so that it will keep going it seems to flood, then stop and fire through the muffler or keep popping. The wiring and timer seem to be in good shape—there is a spark from the carbureter rod and one from the timer rod also. I have hunted for short circuits, but have failed to find any. The car will run along for quite a ways and pull well, then it will fall down. What is the cause of the motor stopping when going at a speed of 15 miles, and then starting again? Is it in the gas or the spark? The gasoline line is clear and gives a good flow of gasoline; and there is a good spark at the plugs. Holding two vibrators down, two cylinders speed up and sound like a two-cylinder motor; while the other two cylinders fire unevenly when the opposite vibrators are held down, and one explosion is much greater than the other and does not speed up, but will die down and run slower than the first two.—F. D. T.

Since you have tried three different carbureters without beneficial results it is quite plain that your trouble is not in the carbureter. It might, however, be in the gasoline feed pipe to the carbureter; there may be a loose obstruction in the pipe itself or in the gasoline tank near the entrance of the pipe, which is gradually drawn into an obstructing position by the suction of the flowing gasoline. The symptoms you give, though, are characteristic of so many troubles that it would be advisable to test your motor in the following manner: Turn the motor over slowly by hand several times with the spark turned off, to test the compression. If one or more cylinders have less than a reasonable amount of compression, examine the valves, see that there is sufficient clearance between the ends of the valve-stems and pushrods; see if the compression is improved by injecting about two tablespoonfuls of oil into the faulty cylinders; if improved, look for stuck or worn piston rings, or worn or scored cylinder walls; if not improved, the splits of the rings may be in line, some of the rings may be broken, or the valves may stick in their guides. Before looking for internal troubles other than compression, go over the ignition system very carefully; have the battery tested with a voltmeter if a storage battery and with an ammeter if dry cells are used; disconnect the high-tension wire from each plug in turn, and while the vibrator is buzzing see how long a stream of sparks will jump from the end of the wire to the ground or lower portion of the plug. If any are shorter or weaker than others look for loose connections, and

to the adjustment of the coil, if adjustment is impossible. The contact points of the vibrators on the coil may be pitted and need dressing down. Examine the plugs, see that the spark gap does not exceed 1/32 inch, and change the one from the defective cylinder to another cylinder and note any change in their operation thereafter. You say there is a spark from the carbureter rod and one from the timer rod also. If Motor Age understands you correctly, this would indicate a short circuit, and it would be advisable to move the wires about while each of the vibrators is buzzing to test for a break or a leak in the insulation. This will be indicated by irregular intermittent buzzing. To sum up and be brief, test the compressions, the batteries, the coils, the spark, then let about a quart of gasoline flow from the feed pipe where it is connected to the carbureter and note if it runs steadily all the time. Cars have been known to act similarly to yours and a weak battery was found to be the only trouble. In this case the carbureter was taken apart, entirely cleaned and readjusted without results. The motor would speed up when idle but immediately die down when ½ or 1 mile from the garage. Leaks in the manifolds were looked for, short circuits were investigated, but all in vain, it was solely lack of current, the battery flow not being enough to build up the voltage in the coil units so as to insure a spark bridging the gap in the plugs.

THE USE OF PICRIC ACID

Ann Arbor, Mich.—Editor Motor Age—I have read in Motor Age of an acid that can be added to gasoline in order to give more power. Will Motor Age give me the name of this acid, the proper proportions to use, and tell me how long it can be used without seriously injuring the valves?—V. C. Sheffield.

Picric acid has been used by many racing drivers one time or another in their gasoline. Some of these drivers claim to have obtained about 5 per cent more speed from their cars by adding 1 ounce of picric acid and 2 ounces of sal ammoniac to every 5 gallons of gasoline. The picric acid is dissolved in a quart of gasoline and then added to the 5 gallons.

CARS TURNING CORNERS

Minneapolis, Minn.—Editor Motor Age—I am sending herewith a picture which has caused no little argument here. The questions I want to have answered or have light thrown upon are: Which wheels leave or have a tendency to leave the ground, and which wheels receive the greatest strain—the outer or inner wheels? Which position will the body take in the several conditions? Does the angle of the roadbed make any difference and does not the speed of the car make some appreciable difference? Is the attached picture correct or incorrect?—Dr. Harrt C. Newgord.

When a car is turning a corner it is the inside wheels that leave the ground, and the outer wheels receive the greatest strain. The top of the body will tend to careen outwards. The tendency of wheels to leave the ground depends almost entirely on the speed as well as the angle of the curve. Where curves are banked this tendency is avoided. The illustration you forwarded is not correct.

TIRE MILEAGE RECORD

Brooklyn, N. Y.—Editor Motor Age—In the January 6 issue of Motor Age I read with much interest the Diamond-tire-mileage experiences of some owners of cars. I have been operating a Packard 30, model B, which was purchased May 15, 1909, which was used for 4 months at Prout's Neck, Me., besides taking the Ideal tour, registering according to the Stewart speedometer, 11,000 miles. This distance was covered with only one puncture on one of the front tires. Is this a record for the year?—J. L. Howard, chauffeur.

USING BATTERY FOR HEAT

Oelwein, Ia.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly answer the following: 1—Does a long stroke develop greater horsepower? If so, what is the formula for determining the horsepower of an engine? If not, why not? Why make long strokes if there is nothing to be gained? 2—What size wire and kind should be used to develop heat from a 6-volt Vesta battery? 3—Would it injure a storage battery to connect it up for use in generating heat?—John L. Bovis.

1—A long-stroke motor develops more horsepower than a short-stroke one with equal bore, but the ordinary horsepower formulæ, particularly that adopted by the A. L. A. M., do not take this directly into consideration, excepting as it is included in the formula in the sense that said formula is based on a piston speed of 1,000 feet per minute. It is natural to assume that in two motors of the same bore, but different stroke, the one with the longer stroke has a greater volume of mixture to explode and there will be a greater impulse from this explosion delivered to the crankshaft. It is true, however, that the crankshaft speed is not so great on the long-stroke as it is on short-stroke engines. The long-stroke engine is a creation of the last couple of years, and up to the present time the selection of a suitable formula covering its case has not been settled.

2—Do you use a 6-60 Vesta battery of the ordinary ignition type, or have you a 6-80 or 6-160 battery? The 6-60 battery is of the jelly type and will not stand a very heavy current discharge, not over .5 amperes. On the other hand, the 6-80 and 6-160's are liquid-type batteries and specially designed for the work you speak of. Not knowing the nature of the use to which you wish to put it, Motor Age cannot state the size of wire, but it should be German silver wire. It is customary to use a 110-volt circuit for the generation of heat, but if the quantity desired is small the 6-80 and 6-160 batteries could be used. It would be possible to use household toasters and the like on such circuits. The size of wire used would entirely depend on the use. A circuit of fine German silver wire would heat very rapidly, whereas a long line of coarse wire would heat very slowly.

3—The answer to this question is included in the answer to No. 2. A 6-volt battery would not be a success for such uses.

WANTS ENGINEERING ARTICLES

Buffalo, N. Y.—Editor Motor Age—Looking over my file of back numbers of Motor Age I note that during the last half year or so there has been a scarcity of articles on the design of motor car parts. I further note that Motor Age allows quite a bit of space to the sporting side of motoring, treating road racing, hill-climbs, and like events to the extent of some six to ten pages per issue. I note that it has a regular department devoted to such subjects as highway construction, signboard campaigns, legal matters, new parts, new cars, repairs, construction and repair kinks, whole pages of trade personals, etc. Each of these divisions, undoubtedly, has its value, but why does Motor Age not have a fair allotment of space per issue devoted to technical articles on the design of motor car parts, giving such mathematical data, formulæ, etc., of interest to the engineer and designer? Surely, this class of men must comprise a considerable number of its readers who, in common with myself, would welcome the appearance of such contributions. Give us articles on: Cylinder design and stresses, stresses in valve parts, connecting rod design, crankcase design, and stresses in same; stresses in transmission parts, front and rear axle design and stresses in same, etc. Serial articles along such lines as above would be especially desirable. In short, have some good technical writers give in each issue of Motor Age a good mathematical interpretation of motor car matters. Why not make this a regular feature of Motor Age?—E. M. Kluck.

RACERS' VALVE ARRANGEMENT

Dubuque, Ia.—Editor Motor Age—Through the Readers' Clearing House will Motor Age describe the valve motion of Hemery's Benz and Strang's Fiat?—O. Stribley.

The valve arrangement on Hemery's Benz is a conventional valve-in-the-head type, the intake and exhaust valve to each cylinder being in the cylinder head and operated by rocker arms. The intake valve is housed in a cage on the head, and the exhaust sunk into the cylinder head. On the big Fiat each cylinder has one intake and two exhaust valves, all located in the cylinder head, the intake at one side and the exhausts on the opposite side. All three are opened by rocker arms with one camshaft. The intake is a single rocker arm, whereas the exhaust rocker arm is of Y shape, having two branches, one to each exhaust valve.

MOTOR CAR DEVELOPMENT

THE Stoddard-Dayton cars for this year are built in three chassis types, which the company has designated respectively as the 30, 40 and 50-horsepower models. Last year the company built three chassis types along this line, so that the continuation of these for the present year is prima facie evidence that the line of cars which the Dayton Motor Car Co. has been marketing during the past year has met with practically all the demands the critical buying public imposes. It is also proof of the fact that three models of this type cover fairly satisfactorily the general car selling field of the present day.

According to A. L. A. M. rating the first or smallest models have a horsepower rating of 24, the cylinders being 3⅞ by 4½-inch bore and stroke. These measurements are the same as used on this model last year. The car is larger, however, in that the wheelbase has been brought up from 103 to 108 inches. This chassis is provided with a variety of bodies, of two, three, four, five and six-passenger capacity, and including touring car, runabout, coupe, town car, landaulet and limousine models. This chassis is fitted with 32 by 3½ and 4-inch tires, which are practically as a year ago.

The Stoddard-Dayton 40-horsepower chassis is unique in that it is the only model of the company in which the motor size used last year has been in any wise changed. Last year this motor was 4 by 5; this year it is 4 3/16 by 5 inches, and now has a rating of 28-horsepower A. L. A. M. Besides having developed in size by the addition of 3/16-inch to the cylinder diameter, this model has developed somewhat along other lines, the wheelbase being increased from 112 to 116 inches, and the 34-inch wheels being now fitted with 4-inch instead of 3½-inch tires.

Lastly, coming to the third Stoddard-Dayton chassis model, namely, the 50-horsepower type, it will suffice to say that the motor dimensions 4¾-inch bore and 5-inch stroke, have not been altered, the official rating being 36.1 horsepower. As with practically all the other models, so with this, the wheelbase has undergone a lengthening process from 113.5 to 120 inches, and up to 128 inches in seven-passenger models. But a stop cannot be made here, because 36-inch wheels are fitted in place of the 34-inch sizes of last year, and 4½-inch tires are used.

Such is a brief summary of the three Stoddard-Dayton chassis of this year, and on which no less than fourteen different styles of bodies are fitted, there being a selection of five body types on the 30, three on the 40 and six on the 50. It is in order here to mention that the Splitdorf magneto is used on the 30 models, the Pittsfield magneto dual system on the 40's, and the Bosch magnetos on the 50's. All three chassis models are alike in general design, using as they do four-cylinder motors of the valve-in-the-head type, cone clutches, selective gearsets and shaft drive.

The improvements in the Stoddard-Dayton motor for this year are confined to the accessory phase of the motor rather than to any of its characteristics. Most important of all is the fact that now there is a separate rocker arm for each valve, whereas last year one rocker arm opened the intake and exhaust valves of each cylinder. With the one rocker arm arrangement it was impossible to overlap the valves, that is, having the intake and exhaust valve of each cylinder open together for a portion of the cycle, a practice which is being generally followed by foreign and American makers, and which simplifies to a considerable extent the problem of carburation. Adopting a separate rocker arm for each valve has necessitated the introduction of another camshaft, so that now there are two, located

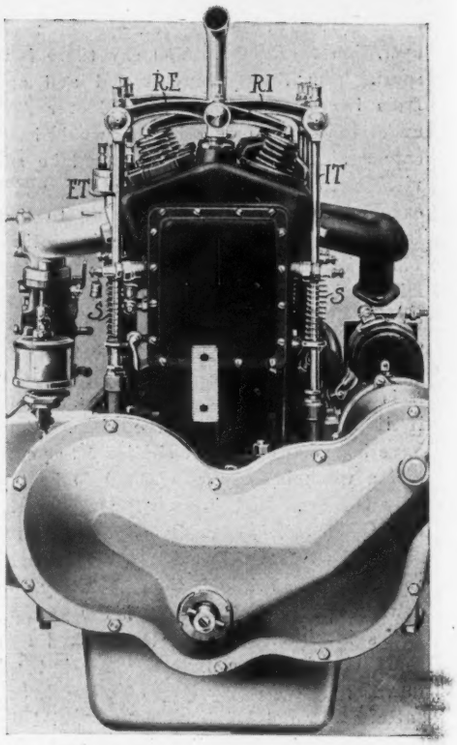


FIG. 1—END STODDARD MOTOR

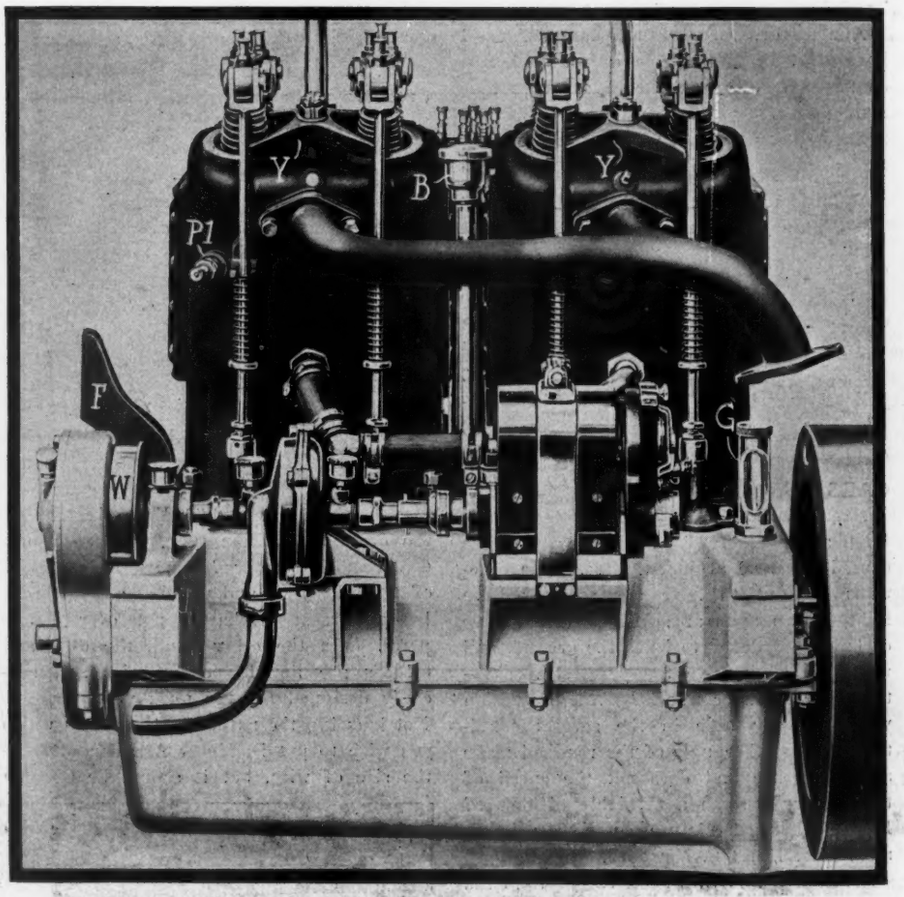


FIG. 2—EXHAUST SIDE OF STODDARD-DAYTON MOTOR

THREE 1910 STODDARD CHASSIS

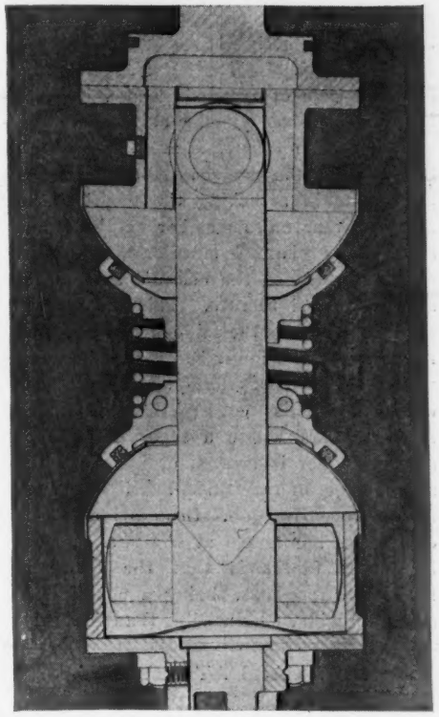


FIG. 3—STODDARD UNIVERSAL JOINT

on opposite sides within the crankcase. Fig. 1, an end view of the motor, shows the double rocker arm scheme, the rocker arm RI for the intake valve and RE for the exhaust. On the magneto side are the intake valve tappets IT with springs S for holding the tappets down upon the cams; and on the opposite side are the similarly designed exhaust tappets ET with their springs S. A particularly compact designing job has been perfected in this rocker-arm design, and which is illustrated in Figs. 2 and 4, in which it is difficult to recognize the presence of the two rocker arms. Both rocker arms are carried on a single yoke and are offset in such a manner as to avoid the staggering of the valves.

A second change, and one which is largely responsible for the altered appearance of the motor for this season, is that the position of the intake and exhaust manifolds has been reversed, the intake now being on the right side and the exhaust on the left. The value of this rearrangement is readily apparent, in that the carbureter is now practically alone on the right side where it is very accessible, and on the left side the magneto and water pump are equally accessible. It will be noted by an examination of Figs. 2 and 4 that the four intake tappets on the left and the four exhaust tappets on the right are not in any wise rendered inaccessible by the carbureter, magneto or water pump. The carbureter is higher than last year, due to the adoption of pressure feed on the gasoline, the gasoline tank on all models being now carried under the frame at the rear of the chassis, as illustrated in Fig. 5. Placing the carbureter on the opposite side from the magneto is a commendable precaution and one being followed at the present time by the majority of manufacturers. This arrangement precludes the possibility of a fire around the carbureter, due to a short circuit of the magneto igniting the gases.

Practically no change has been made in the valve arrangement scheme of these cars excepting in that the exhaust valve cages are now held in place by crow foot yokes Y, instead of the threaded caps S which hold the intakes in place. As Fig. 1 shows, the intakes and exhaust are oppositely placed in the cylinder heads and incline outwards, making a spherical combustion chamber possible. This arrangement has been used on these cars since the adoption of the valve-in-the-head motor.

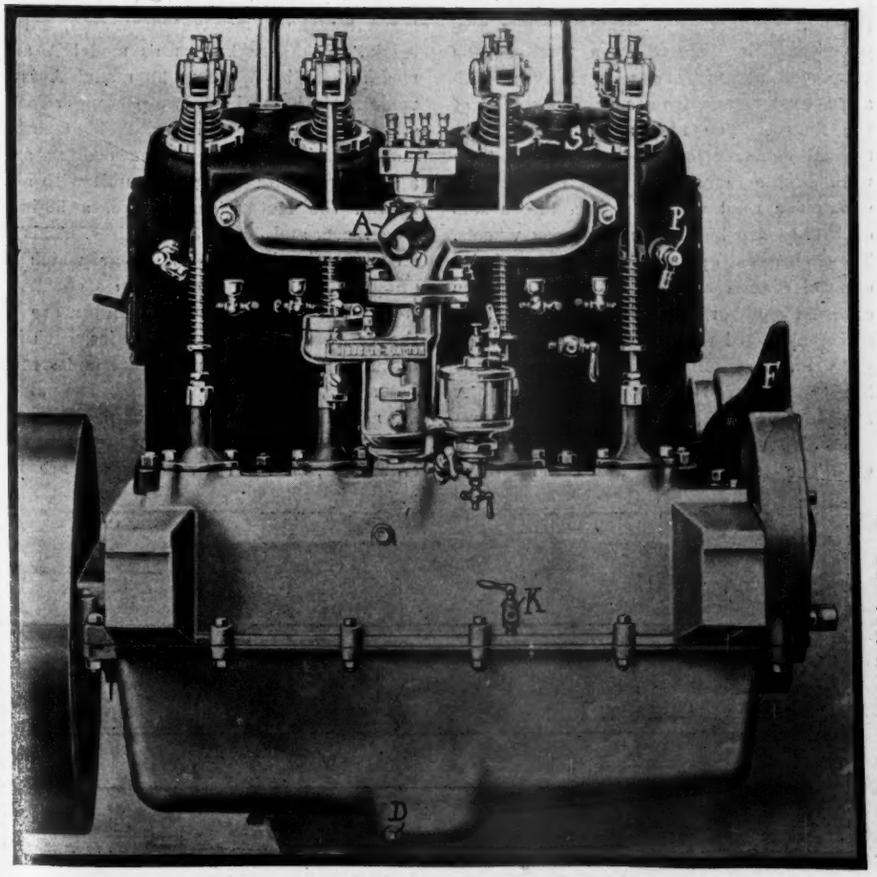


FIG. 4—INTAKE SIDE STODDARD-DAYTON MOTOR

In the lubricating system the Stoddard-Dayton company has been for years an exponent of the circulating oil system, and has a system all its own and possessing numerous characteristics. The leading details of this were illustrated and described in Motor Age January 6, page 25. In brief, the system consists of a gear pump in the crankcase, which pumps the oil through a series of copper pipes attached to the inner walls of the crankcase, the oil through these pipes reaching the crankshaft bearings, camshaft bearings, timer shaft, and supplying the splash level within the crankcase. Instead of the oil flowing through these pipes at a drop-by-drop rate a constant stream is directed through them upon each of the bearings. As in all circulating systems the oil is thoroughly filtered before beginning each circuit of the motor.

In addition to the introduction of the gear pump in place of the plunger type in the motor oiling system, much care has been devoted to the details of lubrication throughout the car, and every point requiring lubrication has been provided with a grease cup, this idea being carried out on all the spring shackles, spring seatings on the rear axle, radius rods, roller bearings at the front end of the propellorshaft, propellorshaft and torsion tube support, speed change mechanism, steering gear,

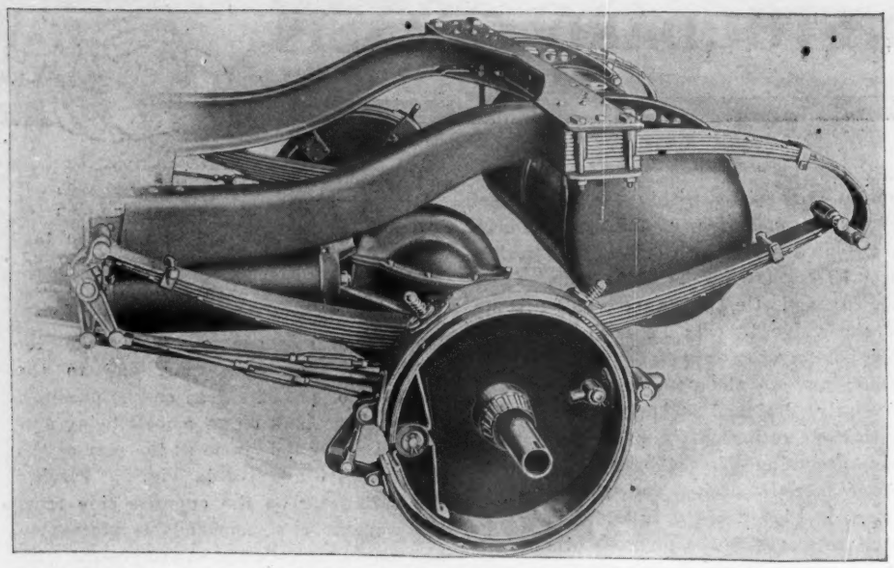


FIG. 5—NEW FRAME DESIGN ON STODDARD CARS

steering gear distance rods, starting crank of the motor, and, in brief, all parts in which the motor oiling system is not taken care of.

In addition to these precautions fitted on the car the company furnishes as the equipment of these cars a special lubricating chart on which is indicated each point that should receive attention, together with a table stating the frequency this attention should be given each part. Reference to Figs 2 and 4 will show the positioning of oil cups on each bearing of the valve rocker arm, both where the rocker arms are fulcrumed on the suporting yoke and where they attach to the tops of the tappet rods. Fig. 2 also shows the fitting of several grease cups on the pumpshaft.

The ignition problem on Stoddard-Dayton cars for this year is much more complete than last in that now two sets of spark plugs are shown, one set on the right side and another set on the left, both being mounted horizontally in the combustion chamber. On the 50-horsepower two distinct systems of ignition operated by one switch are fitted. One system is the Bosch magneto and the other is a battery outfit, together with a Pittsfield four-unit coil and timer. On the 40-horsepower models a Pittsfield dual system is used, and on the 30-horsepower models a Splitdorf dual system is fitted. In the latter two the induction coils in the battery system are carried on the side member frame of the frame beneath the dash.

No change has been made in the principle of water cooling of the cylinders, but the adoption of a honeycomb type of radiator, which takes the place of the vertical-tube type of former seasons has an important bearing on the appearance of the car. In this radiator the general contour which characterized Stoddard radiators last year is continued, as is the oval-shaped filler at the top. In both the illustrations of the motor the bracket F is for the support of the cooling fan, which is driven by a broad belt from the pulley W, this pulley being on the pump shaft and rear of the half-time gear housing, so that the necessity of puncturing the cover of this housing at this point is eliminated.

Leaving the motor and passing to a hurried review of the transmission system there is nothing more to note in connection with the three-speed gearset which remains unaltered. A new universal joint, Fig. 3, has been interposed between the gearset and driveshaft, and in which joint the leather boot is eliminated. The propellorshaft is inclosed in a torsion tube supported at its forward end by a ball-and-socket means from a cross member of the frame. The rear axle, Fig. 8, is a typical construction of the floating type with double races of Timken bearings on which the road wheels rotate. Both sets of brakes are located on the rear wheels. These brakes operate on drums of increased diameter. The foot brake is the external member and is now supported by spring-operated releases which make dragging an impossibility. The emergency brakes are of the expanding type. A brake equalizer has been added.

Of paramount importance in connection with the running gear are the improvements of the frame, which has been made much stouter than last year and of somewhat different design. The Stoddard-Dayton company was one of the first to introduce the arched frame, that is, in which the side members are arched above the rear axle. This arched frame was continued until a year ago, but for the coming season what is known as the dropped frame is used. This is illustrated in Fig. 5. This type of frame is best suited for the use of three-quarter elliptic springs, which for the first time are fitted on all Stoddard-Dayton models. A neat job has been done in attaching these springs, in that the rear cross member of the frame is a heavy channel member which slips over the ends of the channel side pieces and is riveted thereto. This cross piece extends beyond the side members, and forms upper and lower bed plates, between which the end of the quarter spring is clamped. This construction is much stronger than where a separate plate or spring hanger is riveted or bolted to the side member of the frame, and it is a much neater appearing job. In addition to this change in the frame at the rear, a most important factor is that the frame is heavier throughout, being much deeper and with wider channel lips than formerly.

NEW CARS AT DETROIT

(Continued from Page 10.)

sion tube with radius rods to take up the driving strain.

There are two types of cars manufactured by the Flint Wagon Works, Flint, Mich., which are known as model A and model C. The Whiting 20 model A is a moderately low-priced, two-passenger roadster, with a four-cylinder, 20-horsepower motor having thermo-syphon cooling and a selective sliding gearset in unit with and behind the motor, shaft-drive, a 90-inch wheelbase, and 30 by 3-inch tires. This is an attractive-looking little car which is unique for the simplicity of its construction. The cylinders of the motor are of the vertical L type, cast in pairs, with integral waterjackets, and a bore and stroke 3¼ and 3½ inches respectively. The valves are all on the left side, mechanically operated from a single camshaft within the crankcase; and all timing gears are in-

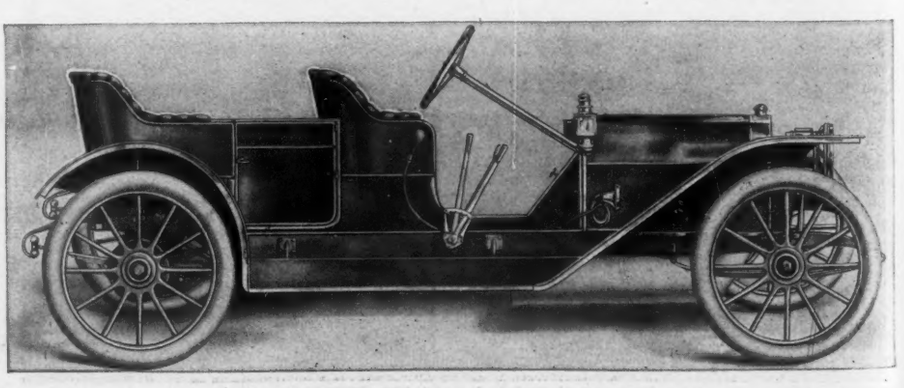


FIG. 6—DE TAMBLE CAR SHOWN AT DETROIT SHOW

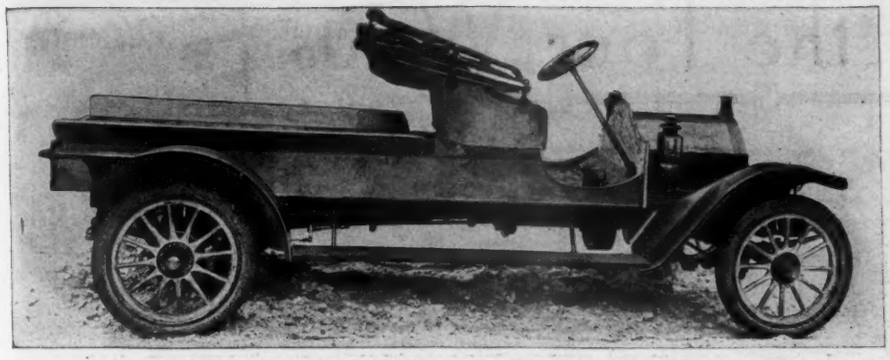


FIG. 7—TEMPLETON-DU BRIE CAR SHOWN AT DETROIT

closed in an oil-tight case. Splash lubrication is depended upon entirely in the motor, the oil supply in the crankcase being automatically fed by gravity from a reservoir situated at the right of the cylinder heads of the motor, just over the exhaust pipe. The oil feed is governed through rods which are attached to the throttle on the steering gear, and the oil supply is thus increased or diminished in proportion to the speed of the motor. The motor, clutch and transmission being of unit construction in this car, the flywheel is placed at the front end of the power plant, and the fan blade spokes therein, in connection with a vertical-tube radiator, are features of the cooling system. The large water connections which are characteristic of all thermo-syphon cooling systems are present in this car and the connections are direct and accessibly located. A dual jump spark ignition system is employed with a Remy magneto and dry cells as current sources and the spark advance or retard, is controlled by a lever over the steering wheel. Carburation is by means of a Breeze carbureter with gravity feed from the supply tank. Transmission from the motor to the gearset is by means of an inclosed cone clutch which runs in oil; and from the gearset, which is very compact, and which gives two forward speeds and reverse, the power is transmitted through a single universal joint and a driveshaft contained in a torsion tube. The rear axle is of the semi-floating type equipped with Hyatt roller and ball thrust bearings. The frame which, of pressed steel channel section, rests on semi-elliptic springs both in front and in the rear; and the brakes are of the internal expanding type liberally proportioned, dustproof, adjustable from the outside for wear, and operating on the rear wheel drums.

The Whiting model C is a five-passenger touring car of medium price equipped with a four-cylinder, water-cooled motor, rated at 40 horsepower. The chassis is of the three-unit type with the motor in front, a selective sliding gearset amidships and a semi-floating rear axle behind. The cylinders of this motor are of the vertical type, cast separately, with integral waterjackets. The exhaust valves are located in the cylinder heads and operated by means of rocker arms and pushrods, and the inlet valves are on the side, as in an L type motor, and operated from the same camshaft with the exhaust valves, which is contained within the crankchamber. Lubrication of this motor is by means of a mechanical oiler which is attached to the frame, under the hood, to the left, and driven by an eccentric on the end of the camshaft, which is on the right side of the motor. The oil from this lubricator is fed under pressure through separate leads, to the cylinders, the timing gears, and the crankcase, and sights are provided to show that the oiler is in operation. Cooling is by means of a vertical-tube radiator, a four-bladed, belt-driven fan, and a gear-driven pump which maintains the water circulation. Dual jump spark ignition is employed with a Remy magneto and dry cells as sources of current, and the spark control is by means of a lever over the steering gear. Carburation is by means of a waterjacketed Schebler carbureter of the standard type, with a gravity fuel feed. All accessories are distributed on this motor with a view to accessibility and simplicity of control and operation. A leather-faced cone clutch contained in the flywheel transmits the power from the motor to the gearset, which gives three forward speeds and from here to the semi-floating rear axle a shaft is employed with a single universal joint behind the transmission and which joint is inclosed in a torsion tube, the rear end of which is rigidly attached to the rear axle housing. Radius rods are also provided to transmit the driving strains to the frame and maintain perfect alignment of the rear axle; and grease cups are fitted to all outboard bearings so that the lubrication of all small parts is carefully taken care of. The frame of the car is of standard pressed steel channel construction, and supported on semi-elliptic springs in front and three-quarter-elliptics in the rear. On the front axle, which is an I-beam forging, all steering knuckles and steering gear connections are provided with oil cups. Brakes which are of the internal and external type on the rear wheel drum are of generous proportions and the control of the car is conventional.

MOTOR CAR LITERATURE

The Buffalo Motorist for January—the official organ of the Automobile Club of Buffalo—is out in a new and attractive garb and has been increased in size. Several pages are devoted to the annual report of the club's work for the past year.

The Lexington Motor Car Co., Lexington, Ky., announces its 1910 models in a large-sized hanger.

The Swinehart Clincher Tire and Rubber Co. draws attention to its tires by way of a hanger assuring "A Safe Home Run" with Swinehart tires.

In an eight-page booklet the Inter-State Automobile Co. tells why it has named the Inter-State car the Bull-Dog.

The Dayton Motor Car Co., in its 1910 catalog features its different models in touring cars, town car, landaulet, limousine, coupe, roadster and torpedo types. Views showing the interior fittings of its limousines are also shown. The usual description and specifications are included. The cover is a simple embossed affair, and the whole effect is particularly attractive.

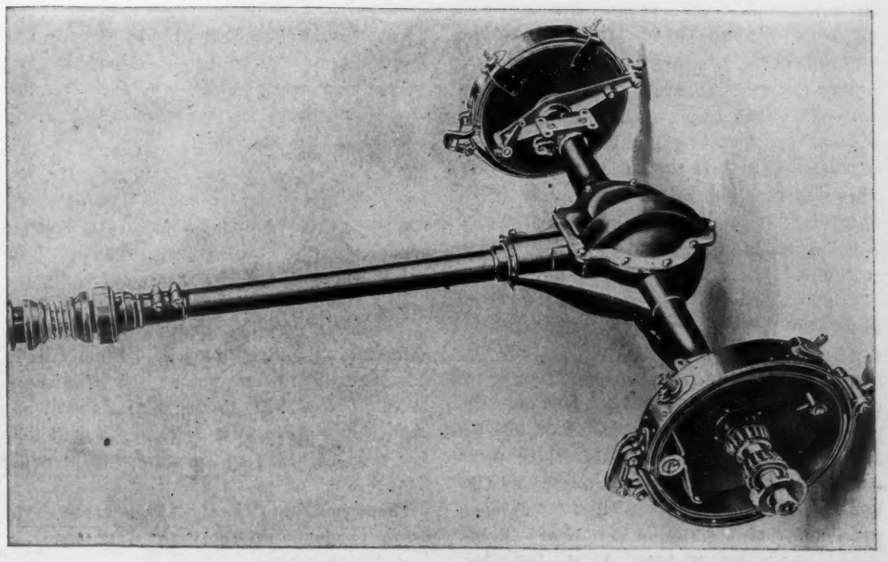


FIG. 8—REAR AXLE CONSTRUCTION ON STODDARD CARS

From the Four Winds

N S E W

PACKARD TESTERS BREAKING THE SNOW ON GRAND BOULEVARD, DETROIT

Building Many Garages—Sixty-eight public and private garages were built in Milwaukee, Wis., during 1909, at an expenditure of $130,500, according to the records of the building inspector.

Address by G. M. Schebler—George M. Schebler, of Wheeler & Schebler, addressed the motor class of the Indianapolis Young Men's Christian Association on the subject of carburation on Thursday evening, January 20. He explained the principles of the carbureters and carburation, using a Schebler carbureter in demonstrating. The class has fifty students.

Connecticut Tags—The new issue of Connecticut state license markers is now in evidence. The color scheme is red and white, in contrast to the staid old black and white which long has been the color of the Nutmeg tag. The dealers' and manufacturers' license tags are white with large red letters. The secretary of state's office has sent out a warning to the fraternity that the change must be made in markers, and some central location will be decided upon for distribution of the new markers.

Two Shows For Los Angeles—From present indications Los Angeles will have two shows. The first is scheduled for the week of February 6-14 in the Grand avenue rink. This will be a show of licensed, unlicensed and foreign cars. The second show, which will be made up exclusively of licensed cars will be held the week of February 19-27. The holding of two shows is the result of a split in the former dealers' association and the organization of strictly licensed association. The independent show will be managed by Walter Hempel. A committee of dealers composed of W. K. Cowan, V. S. Beardsley and L. H. Johnson will assist Hempel. The committee of the licensed association is composed of Fred Flint, P. H. Greer, Henry Fennimore, A. N. Young and Ralph Hamlin. In the independent show there will be forty makes represented. About thirty-two dealers will be represented in the licensed show.

Record For Wisconsin—Wisconsin's registration reached a new high weekly record during last month, when fifty-seven applications for licenses were received in one week. The majority were high-priced cars.

Another Speedway!—Lakewood, N. J., has promised to build a parkway. More than $500,000 will be expended on the proposition. The course as planned will be at least 8 miles in length, and will not cross a public road at any point. A large grand stand will be erected. According to the plans of the promoters, work on the race track will be pushed so as to have it completed for an autumn meet in October.

New Use for a Car—One of the most enthusiastic motorists of Westchester county is Captain A. Kelberg, in charge of the lightouse in Tappan Zee bay, who owns a Maxwell Sportsman. During the recent cold spell Tappan Zee bay became covered with a crust of solid ice, and the captain, who had laid up his car for the winter, found an unexpected opportunity to use it, running it back and forth, on the ice, between the shore and the lighthouse.

Talking Higher Fee—Senator Timothy Burke, of Green Bay, Wis., member of the special legislative committee on good roads of the Wisconsin legislature, has issued an explanation of the proposition to tax motor cars for the benefit of the good roads fund. "This proposition will not be embodied in the new highway bill," said Mr. Burke. "It will be embodied, however, in the recommendations accompanying the bill that legislation along these lines be enacted. We have had under consideration to increase the present license feet of $2 to a larger annual fee, perhaps to $10, as the next legislature shall deem proper and equitable, still leaving motor cars subject to local taxation. This would not be double taxation, because a registration fee is a license fee and not a tax. Such a fee would be a gain to owners of motor cars, as the wear and tear on tires alone would be more than saved were highways in good condition."

Club at Canandaigua—The Canandaigua, N. Y., Automobile Club has been organized with the following officers: President, O. J. Hellenbeck; vice-president, Thomas Johnson; treasurer, William J. Hawley; secretary, C. O. Hallenbeck.

Chauffeurs Choose Officers—The Milwaukee Chauffeurs' Club, recently organized at Milwaukee, Wis., has elected these officers: President, Marcus Wernicke; vice-president, Emil Krueger; secretary, J. E. Mayberry; treasurer, Michael Flynn.

Milwaukee Plans City Garage—It is not unlikely that the plans for the new central police station and criminal courts building at Milwaukee, Wis., to cost $250,000, will include a garage division for the care and maintenance of the twelve cars owned by the city of Milwaukee.

Club at Columbus—A motor club is being organized at Columbus, Wis., home of the Badger Motor Car Co., under the leadership of F. A. Chadbourne. The charter membership is expected to be twenty-five. The club will affiliate with the Wisconsin State Automobile Association and thus with the A. A. A. Stockholders in the Badger concern, all prominent business men of Columbus, will be among the first members.

Beach Course at Lincoln—Motorists at Lincoln, Neb., are planning for a motor racing course which will follow the shores of Capital beach lake. The course will be 4½ miles in length and the entire track will be visible from a centrally-located grand stand. This would be made possible by the fact that the entire course would lie on one plane only a few feet above the surface of the water. It is proposed to

erect the grand stand in the center of a small park. The track will have a few sharp curves.

Money For Roads—By the financial report of the Ohio motor car department for the year ending December 31, 1909, it is shown that the net receipts were $72,218.19. This amount is above the operating expenses of the office and is turned over to the state highway commission for the improvement of the highways.

Boston Merger Planned—Plans are under way to merge the Automobile Legal Association with the Massachusetts State A. A. in Boston. The former association has 3,000 members and if the plan is carried out it will give the members admission to the A. A. A. and at the same time greatly strengthen the state association. The Automobile Legal Association has been in existence some years and looks after the interests of its members when they are arrested and has also been a factor in shaping legislation.

Good Roads Convention in Canada—A committee of the Ontario Motor League had a conference with the Ontario Good Roads Association at a meeting in Toronto last week. The league committee presented a proposal to organize a national good roads convention for Canada to be held in Toronto early next spring under the auspices of the various associations throughout the country interested in good roads. It was pointed out that there was need of a definite united policy on good roads which all parties interested in the cause of good roads can work together for. At the proposed convention the leading authorities from this country and the United States will be present and will address the convention on different phases of the good roads question. The Ontario Motor League has undertaken to contribute a large part of the cost of upholding and organizing the convention and it is expected that the Ontario government will also assist, as it has done with good roads conventions in the past. The work of organizing the convention will be done through the office of the secretary of the Ontario Motor League, E. M. Wilcox.

Los Angeles Dates—Dates have been set for the opening meet of the new Los Angeles board track. Seven days, April 8, 9, 10 and 13, 15, 16 and 17, are the dates selected. Work on the new track and cartage of lumber began last week. Differing from other courses in that it will be a perfect circle, 1 mile in circumference and 75 feet wide, with a 25-foot banking all around, the track will be made of Oregon pine.

Will Pike the Roads—At a recent meeting of county and city officials at Toledo, O., it was decided to improve that portion of the old Harrison state road consisting of about 15 miles, lying in Sandusky county, O. The road will be piked at a cost of about $80,000, the state paying one-half, the county one-fourth, and the townships one-fourth. When completed it will be one of the finest motoring routes in the state because of the historic interest attaching to the locality.

Another Chauffeurs' Organization—The Massachusetts Automobile Operators' Association is the name of the newly-formed organization of chauffeurs in Boston. The organization now has more than 400 members and it plans to work out several reforms, among them to put a check to reckless driving. Before a driver is eligble to membership he must be vouched for by three other members, and he subscribes to an agreement to obey the laws and not to use his employer's car without the latter's consent. A committee will consider complaints of reckles driving, and if it is done by a member of the association he will be dealt with by the organization. If it is an outsider he will be notified by letter and politely asked to be more careful in future. The organization has received many letters of commendation from prominent motorists. The officers are: President, J. Edward Connors; first vice-president, Henry A. Kroh; second vice-president, Matthew Downey; secretary, Charles P. Buker; financial secretary, LeRoy Dillenbeck; treasurer, J. Putnam Ware; directors, W. Frederick Pratt; Albert A. Hanson and Henry G. Lawson.

Franklin Heads List—A list of the number of motor cars for which licenses are now in force in the state of Washington shows that the Franklin heads the column with a total of 322. Only four other makes have over 200 licenses in the state, and only three others have more than 100.

Officials Do Not Act—The present motor vehicle laws of New York state are likely to be modified by the legislature there this year. The great complaint against the operation of the present law is that of reckless driving. The trouble is not that the speed restrictions are not severe enough or that the penalties for their violation are not heavy enough, but that public officials do not exercise the power which the law gives.

New Officers Necessary—The annual meeting of the Bay State A. A., of Boston, will be held next month when the election of officers will take place. President Fred Tudor has notified the nominating committee that he will not be a candidate for re-election, and Secretary James Fortesque, who has held his position for several years, also wishes to retire from his duties. It seems likely that one of the Boston dealers will be chosen president of the organization.

Start Insurance Company—A bill has been presented to the Massachusetts legislature to grant a charter to Bay state motorists who propose to form a mutual insurance company so that they may be able to insure motor cars from fire and accident and at a more reasonable rate than is charged at present by various companies handling that sort of business. President Frederic Tudor, of the Bay State A. A., is one of the men behind the movement, it is asserted.

SNOW SCENE IN BELLE ISLE PARK, DETROIT—DEBUT OF NEW ABBOTT-DETROIT

Legal Lights and Side Lights

MAKING A TEST CASE

THERE'S a tumult in the erstwhile quiet Quaker City over the exact meaning of that section of the new state law which provides that "every person desiring to operate a motor vehicle as a chauffeur, or as a paid operator, shall first obtain a driver's license." Assistant Deputy Attorney General William M. Hargest is inclined to the opinion that it includes every person who drives a car. There are many others, perhaps not so well equipped legally, who think that the framers of the measure never intended that a friend or relative of an owner who shall take a turn at the wheel without having first paid $2 and secured a badge, should lay himself open to prosecution as a law-breaker. On Thursday last the attorney of the Quaker City Motor Club, G. Douglass Bartlett, launched a test case and had a clubmate, Stanley F. Cooper, arrested on his own admission that the car he was driving was his sister's and that he had no driver's license. Magistrate Scott, before whom the case was heard, fined Cooper $10 and costs, whereupon Lawyer Bartlett appealed, and the culprit was held in $100 bail for court. The case will come up within the next fortnight, and meanwhile the local clubs, which are with the Quakers in their effort to secure an interpretation of the obscure wording from the highest legal authority in the state, will endeavor to find out from the legislators who were prominent in framing the law just what was intended by the words "as a chauffeur, or as a paid operator." Is the last half of the phrase a synonym of the first half, or are two separate classes of the motoring cult intended? Upon the legal determination of the exact meaning of this bit of muddled verbiage depends the peace of mind of not a few Pennsylvanians.

TERRY PLEADS FOR UNIFORMITY

Charles Thaddeus Terry's plea for uniformity in motor legislation before the convention of the National Civic Federation in Washington struck a popular chord. Mr. Terry's speech virtually outlined the fundamental objects of the coming national legislative convention to be held under the auspices of the American Automobile Association in Washington just 1 month later, on February 15, 16 and 17, to which the governors of all the states have been invited to send as delegates their accredited representatives in charge of the enforcement of their respective motoring laws. He said: "There are thirty-three states which have separate, distinct, and in many respects very different motor vehicle regulations. There are two ways in which this particular evil may be cured—one is by the enactment by congress of the federal registration bill and the other the enactment by all the states of a uniform motor vehicle law exempting non-residents from its registration provisions, as does, for example, the law of the state of New York. It is conceded that more harm and injustice are sometimes brought about by lack of uniformity of the laws of the various states than by imperfect or even bad laws in special instances. Nowhere is this better illustrated than in the case of travel upon the highways.

"To take a concrete example, suppose that one were to start in his motor vehicle at New York to make a trip to his national capital at Washington, to transact business with his government. He no sooner will have left the ferryboat on the Jersey shore before he will be stopped and notified that he can proceed no further. He will find that what he always had assumed to be his natural right to use the highways of the country so long as he scrupulously regarded the rights of others upon the highway has been erected into a privilege to be purchased only by the payment of money and the expenditure of time and trouble in seeking out one of the government officers and paying fees for a so-called license. He must find the proper officer at the place where these fees are received, fill out and sign an application blank, pay his money and receive four tags, each one of which is good for 2 days' enjoyment of this grand privilege of using the highways; and after he has done all these things he will find that the state is not yet satisfied. He must, before he may proceed, fill out and execute a regular power of attorney, making the secretary of state his agent to receive process in any proceeding which may be brought against him while he is enjoying this so-called inestimable privilege.

"When he reaches the borders of the state of Maryland he will be again held up and obliged, before he will be allowed to continue his journey, to go through very much the same annoyance, inconvenience and expense when he attempts to cross the line into the District of Columbia, and it will be very likely that when he reaches the seat of his national government he will be so incensed as to have entirely forgotten the business upon which he came, and be possessed only with the idea that there should be some power in the national government to remedy the evil of which he has been a victim, and that if there is such power, it should be speedily and effectively applied.

"There is no reason why a license to operate a motor vehicle good in New York should not be equally good in San Francisco and in every portion of the highway between these two cities, and why one knowing thoroughly the law under which he has secured such license should not be able to proceed from New York to San Francisco in the perfect confidence that if he obeys that law he will not be violating the law in any of the jurisdictions traversed by the highway upon which he travels."

A. C. A. RECOMMENDATIONS

At a meeting of the governors and the law committee of the Automobile Club of America, Congressman Olcott's bill, providing for federal regulation of motor cars engaged in interstate commerce or the postal service, was again approved and its adoption by congress was urged as desirable. With reference to proposed New York state legislation, the club has adopted resolutions favoring a series of propositions as follows:

1—An amendment to the existing law is preferable to the enactment of an entirely new motor statute.

2—A reasonable tax, based on horsepower, A. L. A. M. formula, is the fairest way of supplying revenue to the state.

3—A reciprocity provision is desirable whereby cars owned and licensed in other states may be operated in this state under the home license, provided the home state allows cars owned and licensed in New York state to operate therein under the New York license.

4—Professional chauffeurs should be required to take out a license. Owners should not be required to do so.

5—The examination of owners of machines, or of chauffeurs with respect to their ability to run a car, is not practicable, in such a way as to be productive of any useful results, but

6—All licenses to whomsoever granted should be subject to suspension or revocation by some state authority either upon the recommendation of any magistrate before whom the offender has been tried or upon its own volition whenever after examination any holder of a license is found to habitually operate in a way to endanger the life and safety of others.

7—All license fees and fines and penalties collected for any violation of the law should be transmitted to the state treasury within a reasonable time, and the proceeds of all license fees and penalties should be used by the state for the maintenance of its improved highways.

8—The identification of cars should be made easier by enlargement of the number, from 3 to 5 inches in height, and by a requirement that at night the tail light should be so adjusted as to illuminate the number plate.

9—Reasonable speed in lieu of arbitrary limits is still the desideratum.

10—Any charge for registration designed for revenue should be collected on the ownership of the car, and be independent of the license fee required of drivers, which should be retained in a figure sufficient to pay the cost of issuing the same.

11—Penalties should be measured to some extent by the violation, and in trivial cases should be supersedable in the magistrate's discretion by an admonition.

12—The function of bail is not punishment of an offender, but solely to insure his attendance in court when required; except in cases of accident, bail should not exceed $100 in amount and should be a matter which the magistrate may dispense with, and except in cases of accident the magistrates in the city, as well as in the country, should dispose of the case forthwith and summarily either by the imposition of a fine or by acquittal.

13—Arrests in trivial cases should be superseded by a provision for service of summons or notice.

The Motor Car Repair Shop

IN THE year just past much has been written and many illustrations given on how to start the engine on a motor car without danger of injury to the operator in case of back kick. Judging from the marked similarity of all these articles and illustrations it is clear that in the minds of the editors left-hand cranking is the only proper solution of this necessary evil. The consensus of opinion being that in a motor cranking in a clockwise direction, the start should be made by gripping the starting-crank with the left hand, that the thumb should be folded back against the side of the fore finger instead of being used in grasping the handle, and that the crank then should be pulled up against the compression from left to right. The only part of this advice that Motor Age can agree with is that the crank should be pulled up against the compression instead of pushed down. The left hand should not necessarily be used to crank the motor unless it cranks in an anti-clockwise direction, or unless the operator is left-handed and finds that left-hand cranking is easier and more to his inclination. And to spin a motor—to turn it over rapidly several times in succession—is very impractical if not impossible without using the thumb in gripping the handle of the starting crank. It is granted that left-hand cranking is less dangerous than right-hand cranking under certain conditions; but people do not walk from town to town nowadays to avoid a possible railroad wreck.

Left-Hand Cranking

It is claimed that left-hand cranking removes the danger of being injured in case of back-firing, because the arm is thrown outward away from the reach of the crank as it flies backward. This is quite true as far as the tendency of throwing the arm outward is concerned, but it does not prevent him who hangs onto the handle from trying to bite a chunk out of the radiator, nor does it remove the danger of being impaled upon a lamp bracket, and it requires that the operator take up such an awkward and unnatural position that only one man out of many prefers to use the left hand. It is also claimed that by using the left hand in starting the operator is more securely balanced, and his central position in front of the machine enables him to exert greater strength and make quicker movements than he could possibly do otherwise. This, which is not true of the left hand, except with a man who is left-handed perhaps, is true when the right hand is used; and any reader who is right-handed may easily convince himself of the folly of the above statements by trying to crank his motor with his left hand. Notwithstanding the fact that left-hand cranking has been strongly advocated for years, it might be safe to state that among repair men, mechanicians and chauffeurs there are not as many as one out of every hundred that cranks a motor with his left hand.

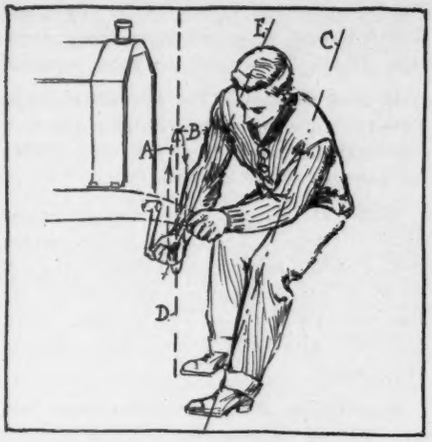


FIG. 1—CRANKING THE MOTOR

Perhaps one of the strongest arguments in favor of left-hand cranking was given by a repairman, who said that the left hand should be used because one can get along much better with a broken left hand than with a broken right one.

As the most convenient and safest method of cranking the engine of a motor car, Motor Age suggests the use of the right hand as shown in Fig. 1. The operator stands directly in front of the radiator, with the right foot just touching the imaginary line D which is dropped from the end of the crank-handle; the handle then is taken hold of with the right hand, and the left hand is placed on some rigid and convenient part of the car and is used to assist in the support of the body while the operator leans backward as designated by the dotted line C. In taking up this position it is necessary to cross the right arm in front of the trunk of the body, the body then is turned a little to the left, and as the operator starts to pull up on the crank-handle, the arm which at this time is practically straightened out, is at an angle relative to the dotted line D as indicated by the dotted line E. In this poise it is possible to conveniently bring into effective action the strongest muscles of the body, and as the crank is drawn up near the top center, where a backfire generally occurs, it will be found that the angularity of the body and the cranking arm increases so that in case of back-fire it will be impossible to hold on to the crank-handle, for it will be jerked out of the hand, and the arm and body will drop out of range of the flying handle designated by the dotted lines B. In a few words, Use the right hand if most convenient but do not get over the starting-crank, lean away from it. The writer has found it most convenient to grasp the horn of the frame with the left hand in the majority of cases, as illustrated, but this is not always most convenient.

It is not good practice to take hold of the radiator because this will have a tendency to bring the operator over the crank in a dangerous position, radiators sometimes become rather warm—warm enough to burn the hand—and by holding on the filled cap of a radiator while cranking the radiator may be severely strained, with a leak as a result. It also is bad practice to hold onto the lamps, for besides the possible danger of breaking them, one is liable to unconsciously place the hand on the lamp while it is burning and be seriously burnt. In conclusion let it be agreed that left-hand cranking is the least dangerous, but if the right hand must be used, get the habit of leaning away from the crank-handle. If spinning is necessary to start a motor, it is good practice to do the spinning with the switch off, then when a good supply of fresh gas is drawn into the cylinders, turn on the switch, and if the motor does not start on the spark it may generally be started by simply pulling up on the crank.

Electrolyte—the Battery Fluid

The correct technical term for the fluid in a storage battery, which is often called acid, is electrolyte. This fluid is a mixture of four and a half parts by volume of distilled water to one part of pure concentrated sulphuric acid. Should it become necessary to replace it on account of loss by spilling or leakage, the strength above indicated should be used; but evaporation loss should be made up with a more dilute acid, consisting of ten parts of water to one of pure concentrated sulphuric acid. It is of the utmost importance that distilled water and the purest sulphuric acid be used, as impurities quickly affect not only the life of the battery plates but the proper working of the battery, particularly its ability to hold a charge for any length of time. Acids other than sulphuric will ruin the plates absolutely. At the beginning of the charge the electrolyte properly should be on a level with the tops of the plates, and at the end of the charge it will have risen about ¼ inch. Never use a match to examine the height of the fluid in regard to the tops of the plate, while the battery is on charge, and care should be taken not to hold a flame of any kind near the vent of a battery while charging, for the gases generated, may ignite and explode.

Among the Makers and Dealers

Will Build in Spring—O. R. Hughes, of Marshfield, Wis., has purchased a site for a large new garage, work on which will begin early this spring.

Garage For Bellevue—The Bellevue Automobile Co. has been formed at Bellevue, Pa., a north side suburb of Pittsburg, by George J. Kurtz, Louis Appel, Alton Hamilton, William Bittel and J. H. Ehrhardt and will have a new garage there soon.

In For Themselves—George H. Hudson and Samuel P. Colby, formerly with the French Carriage Co. that had the agency for the Herreshoff in Boston, but which went into bankruptcy some time ago, have formed a partnership to handle motor cars and carriages. They are now located at 121 Massachusetts avenue.

Liberty Company Formed—The Liberty Automobile Co. is a new concern in Pittsburg formed by L. E. Randle, of the Shady Side Motor Car Co., and J. Joe Feicht, who has handled the Reo in Pittsburg and will have headquarters at 5989 Center avenue, the former home of the Central Automobile Co. The Liberty will handle the Hupmobile and the Regal cars and the Hart-Kraft commercial wagon.

Builds a Motor Sled—During the recent snow in Columbus, O., J. Shrum, a boy 21 years of age, living at 1161 Mount Vernon avenue, rigged up a motor sleigh which excited the attention of a large part of the city. The sleigh was made out of an ordinary sled, equipped with a third runner for steering and with a circular saw, which furnished the motive power in connection with a motor. The sled was equipped with an old body. By an ingenious contrivance the circular saw was so fixed that by a lever it could be raised and lowered, thus adjusting it to the unevenness of the surface of the snow and ice.

In New Quarters—The Boston Overland agency is now located in its new quarters, 161 Columbus avenue, with C. G. Andrews as manager of the concern.

Show at Bangor—The annual motor show at Bangor, Me., known as the eastern Maine motor show, is scheduled for April 23 to 29. An attempt to hold a show there last year did not meet with success. Portland will also have a show some time in the spring.

New Falcar Plant—The Fal Motor Co., of Chicago, expects that its new factory will be ready for occupancy on or about June 1. It will have 250,000 square feet of floor space, its own power plant and a ½-mile testing track. It is the company's idea to gradually work into the manufacture of all parts of the Falcar.

Monitor Agencies Placed—Charles R. McClellan & Co. have recently arranged for the handling of Monitor commercial cars, built by the Monitor Automobile Works, Chicago, and have opened headquarters at 1777 Broadway, New York city. Mr. McClellan is eastern representative. H. P. Galbreath has made arrangements to handle the Monitor in Kansas City, Mo., and has opened headquarters at 3324 Main street, Kansas City. Other agency appointments are: Rhode Island Machinery Co., Pawtucket, R. I.; Weaver Automobile Co., Cedar Rapids, Ia.; T. A. Hilliard, Sioux City, Ia.; William Greve, Fairbury, Neb.; Western Automobile Co., Omaha, Neb.; Johnson & Johnson, Gibbon, Minn.; G. W. Yates, Champaign, Ill.; Fred Lege, Galveston, Tex.; J. G. Lewis, Rushville, Ind.; Iowa Automobile Co., Waterloo, Ia.

New Hopewell Factory—After the first of the month Hopewell Brothers will have moved from Cambridge, Mass., to their new factory in Newton, Mass.

Fetcher Joins Premier Forces—M. B. Fetcher, for the past 8 years identified with the retail trade of Denver, Col., has joined forces with the Premier Motor Mfg. Co., Indianapolis. He will act in the capacity of traveling representative for the company.

Kline Appointments—The B. C. K. Motor Car Co. has closed contracts for the sale of its cars with the Frank O. Renstrom Co., San Francisco, Cal.; Edwin C. Ide & Co., Syracuse, N. Y.; H. M. Colgrove & Co., Buffalo, N. Y.; A. N. Brunner, Newark, N. J.; Deyo & Johnston, Kingston, N. Y.; Glen D. Edmonds Co., Los. Augeles, Cal.

Louisville Events—The Durham Automobile Co., handling the Velie in Louisville, is a recent addition to the colony. It is at 438-444 Third street. The Olds Oakland Motor Co. now is in its garage on Fourth avenue near Broadway. The Southern Auto Co. recently filed a charter in the county clerk's office, listing its capital at $28,000. The incorporators are W. H. Montgomery, W. H. Luesing and William A. Baker.

Making Pipestone Spark Plug—The American Machine Co., of Eau Claire, Wis., recently incorporated, has started the manufacture of a patented pipestone spark plug, chemically-treated, at North Dewey and Wisconsin streets, Eau Claire. About 1,500 finished plugs are turned out daily. The company has elected the following officers: President, J. C. Tanberg, of the Tanberg Automobile Co.; vice-president, F. R. Fair; secretary, L. C. Brown; treasurer, C. A. Tanberg.

Starts National Garage Service—The Buick Automobile Supply and Garage Co., of Michigan, with an authorized capital of $1,200,000, has practically perfected its organization. The headquarters will be at Saginaw. This is the project launched by the Buick interests for the operation of a national garage service. Although the parent company is incorporated in Maine, the headquarters of the garage service will be in Saginaw. Options have been closed, it is said, on twelve garages in Michigan, and the company expects to have garages in thirty-nine cities in the state. Following the establishment of garages in Michigan the work will be extended to other states until all are included. It is the plan of the company to bring manufacturers and owners into direct contact for repairs

WHITE GASOLINE TRUCK HELPS NEW YORKERS DURING SNOW BLOCKADE

and the purchase of parts and accessories. It is claimed that this will materially lessen the cost both of parts and repairs.

Ollier Makes a Change—L. J. Ollier, formerly in the supply business in Los Angeles, has been appointed the Pacific coast representative of the E-M-F.

New Ohio Electric Agencies—The Ohio Electric Car Co., of Toledo, has placed agencies for its shaft-drive electric with the Mathewson Automobile Co. at Denver, the Dunham Automobile Co. of Louisville, and the Smith Automobile and Battery Co., St. Louis.

Handling the Overland—The Overland Auto Co. is a new firm which has been established in Grand Rapids, Mich., for the purpose of handling western Michigan for the Overland. J. R. Jackson is manager of the company, which will handle twenty-six counties in Michigan and has opened a garage and salesroom at 121 Island street.

Co-Operative Truck Business—Sioux City promoters are planning the establishment of a centrally located garage as headquarters for a big motor trucking business which it is proposed to install. The plan is to buy a dozen heavy trucks and 2 dozen light delivery wagons within 90 days and secure the business of the mercantile houses of the city, working along co-operative lines, thus reducing expenses to the minimum.

Has New Road Map—A company has been formed in Kalamazoo for the purpose of manufacturing a road map for motorists. The capital stock has been fixed at $50,000 and the officers are: President, George Johnson; vice-president and general manager, J. B. Rhoades; secretary and treasurer, Charles Bayton. The guide is the invention of Mr. Rhoades. It is an instrument to be placed on the wheel where the tourist can see it. The driver sets the instrument according to the number of miles to the place where he is to turn. When this place is reached a bell in the instrument rings, and an indicator shows which way to turn.

Swinehart Election—At the annual meeting of the Swinehart Clincher Tire and Rubber Co. it was voted by the directors to call a special stockholders' meeting 30 days hence to vote on the question of increasing the capital stock of the company. It is now $200,000, a large part of which was issued during the last year. W. W. Wuchter was elected president to succeed J. A. Swinehart, who retires from that position to become vice-president; C. O. Baughman, secretary, and R. A. May, treasurer. W. W. Wuchter is general manager. Frank R. Talbot was elected to the board of directors to succeed J. O. Surbey. The rest of the board as chosen is as follows: Frank B. Theiss, William Byrider, R. A. May, Joseph Dangel, Frank R. Talbot, J. A. Swinehart and W. W. Wuchter. Good reports for the last year were submitted and it was voted to pay a 2 per cent dividend quarterly during the next year. The word "clincher" was dropped from the name of the company.

New Parts Deal—A heavily-capitalized concern for the purpose of manufacturing differential gears has been organized in Syracuse, N. Y. The new company will be known as the Brown-Lipe-Chapin Co. and will take over the entire differential gear department of the Brown-Lipe Gear Co., the stockholders of which will hold a controlling interest in the new corporation. C. S. Mott, of the Weston-Mott Co., Flint, Mich., will be the only other stockholder. The business of the Brown-Lipe-Chapin Co. will be managed by H. W. Chapin, who for the past 15 years has been manager of the Brown-Lipe Gear Co. Mr. Chapin also will retain the position of general manager of the Brown-Lipe Gear Co. The new company will continue the policies of the present concern and assume all contracts made by the Brown-Lipe Gear Co. for the purchase of materials and sale of differential gears. The machinery and equipment now employed in the production of differential gears by the Brown-Lipe Gear Co. will be turned over to the new company, together with the entire force of skilled workmen and all will be moved into a much larger factory building that is to be erected this spring. A site for the new plant has been secured near the present Brown-Lipe Gear Co. factory in Syracuse. Upon it will be erected a six-story building and have a floor space of 150,000 square feet. The case hardening and tempering plant, also the power and heating plant will be in separate adjoining buildings which are to be erected. The Brown-Lipe-Chapin Co. is being incorporated under the laws of New York state with a capital stock of $1,500,000, all of which has been subscribed for by the present stockholders of the Brown-Lipe Gear Co. and C. S. Mott. The officers of the new company will be Alex. T. Brown, president; W. C. Lipe, vice-president; H. W. Chapin, secretary and treasurer, who with C. S. Mott and H. J. Mallory, of Flint, Mich., will compose the board of directors.

Puckett in Indianapolis—Ralph C. Puckett now is located in Columbus, O., as general manager of the American Auto Co., sales agent for the American car.

Will Make Wheels—The Sarven Wheel Co., of Indianapolis, has installed a complete equipment of the machinery for making motor car wheels in all sizes. The organization of this company dates back to 1850. The factory will have a capacity of several hundred wheels each week, and the present managers of the company are W. E. Maxwell and O. R. Clements.

West Allis Prominent—West Allis, Wis., a suburb of Milwaukee and ranked as the greatest machinery manufacturing city in the world, is coming into prominence as a center for the production of motor cars and parts, as well as accessories. The Sternberg Mfg. Co., builder of the Sternberg trucks and commercial cars, is erecting a $65,000 plant in West Allis. The Pressed Steel Tank Co., manufacturing gas tanks for a leading concern, is now building a $30,000 addition and will add 200 men to the pay roll.

Hartford Happenings—George D. Knox, agent for the Peerless in Hartford, Conn., has taken on the Hudson and has as territory Hartford and Tolland counties. E. H. Harris has taken the agency of the Overland which was recently relinquished by A. W. Peard. A garage is being built for E. J. Hoadley on Hoadley place. The building is to be 46 by 90 feet and will have about 4,000 feet of floor space with no posts to interfere with the free passage of cars. The Hartford Automobile and Boat Supply Co. has filed a certificate of incorporation with the secretary of state. The purpose of the concern is to manufacture, vend and traffic in motor cars, motor cycles and the like. The amount of capital stock is $50,000, of which $4,000 will be

MOTOR SLED DESIGNED AND BUILT BY TWO COLUMBUS BOYS

started on. The incorporators are T. Edward Oakes, William J. Rabbitt and George J. Stoner, all of this city.

New Marietta Concern—The Marietta Motor Car Co., of Marietta, O., was incorporated recently with a capital stock of $10,000 by G. S. Ellis and others to do a garage business and operate a sales agency.

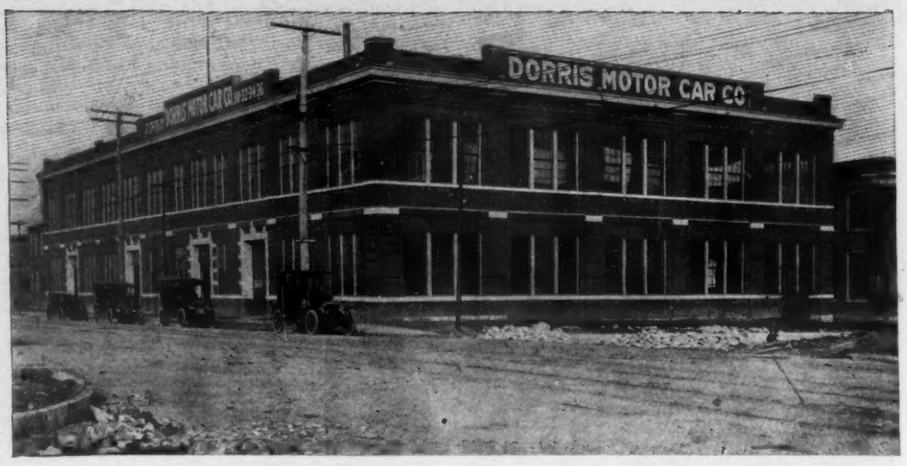
Aplco, Not Apple—Reference was made in a recent issue of Motor Age to the Apple dynamo and Apple lighting storage batteries, but the Apple Electric Co. now calls attention to the change in name it has made and states that the dynamo and batteries now are being marketed under the name of Aplco.

Iowa Sales in 1909—Motor car sales in Iowa for the past year, according to the records of the secretary of state, were nearly equal to the combined sales of the 5 previous years and almost double those of 1908. The aggregate sales for 1909 were about 5,500 machines valued at $8,000,000. There are now 13,348 cars registered in Iowa.

E-M-F Agent in Pittsburg—The Pittsburg Automobile Co. has increased its capital from $5,000 to $50,000 and has taken the Pittsburg agency for the E-M-F and Flanders. The company has moved from Grant boulevard and Seventh avenue to Baum stret, East End, and has leased its former location to Leo Kaufman, a dealer in oils and supplies.

In Temporary Quarters—The new Wisconsin branch of the Buick Motor Co., in charge of George P. Hewitt, with headquarters in the Matthews building, has procured temporary quarters for salesroom, supply department and repair shop at 176-178 Thirteenth street, near Grand avenue. The Wisconsin branch represents, besides the Buick, the Welch, which has been carried by the Stephenson Motor Car Co. and its predecessors, the Solliday Motor Car Co., for several years.

Kline's Two Plants—The B. C. K. Motor Car Co., manufacturer of the Klinekar, has equipped its new buildings at East York, N. Y., with the modern machinery. The machine shop is 125 feet long by 80 feet wide. The drafting rooms, like the offices, are modern in every respect. These departments occupy floor space 98 feet by 35 feet. The engine plant at Bath, N. Y., was purchased some time ago and only recently the company purchased the properties which are composed of a two-story main building 210 feet by 60 feet with a two-story wing 90 by 60 feet. The company found this plant to be too small and has let contracts for an additional two-story building 150 by 42 feet. Several days ago it made an appropriation of $44,000 for the purchase of new machinery—$32,000 for the Bath plant and $12,000 for the York plant. Work is being pushed through on the various models and lots of 100 cars are being sent out from the body, paint and upholstering departments. The company commenced delivering sample cars to its agents November 1, 1909, and is shipping in quantities now.



PLANT OF THE DORRIS MOTOR CAR CO. OF ST. LOUIS, WHERE DORRIS CARS ARE MADE

Making Light Trucks—The Wallof Motor Truck Co., capitalized at $100,000, has ben formed in Minneapolis to manufacture the Wallof light-delivery truck. The Wallof truck is a two-cylinder two-cycle air-cooler of conventional design.

Truck Shows Its Worth—The work of removing the last fall of snow from the streets of New York furnished a striking example of the efficiency and earning capacity of the modern motor truck, as compared with the horse-drawn vehicle. In order to expedite his task, William N. Edwards, commissioner of street cleaning, secured the services of a White 3-ton gasoline truck and put it to work side by side with the horse-drawn wagons so that the comparison between the two might be based on similar conditions of service. The official figures of the street cleaning department show that the White truck did at least four times the work of the ordinary two-horse truck. First of all, the motor truck carried 10 cubic yards of snow as compared with 5 cubic yards carried by the ordinary contractor's wagon—such as a brick cart. The motor truck was loaded at Union square, made the trip to the dock at the foot of East Eighteenth street, was unloaded, and returned to Union square in an average of 40 minutes, while the best recorded time for a two-horse truck was 1 hour 20 minutes. The rate paid by the city was 36 cents a cubic yard, so that the White truck earned $7.20 while the best of its horse-drawn competitors was earning $1.80. If the average performance of the two-horse truck was considered, the comparison in favor of the motor truck was even better. At frequent intervals, horses would fall down and it was a matter of no small time and labor to get them on their feet again. Again, all of the teams traveled in a beaten track. If one team was delayed, all those behind it were halted. The motor truck, under such conditions, would simply pull through the drifts at the side of the road and pass around the stalled teams. Furthermore, the efficiency of a two-horse truck gradually diminished as the day advanced, while that of the motor truck was unchanged.

Buy Rising Business—The business of R. S. Rising, of Ainsworth, Neb., has been purchased by W. F. Smith and George O. Sawyer, who will handle a line of Studebakers under the name of the Ainsworth Automobile Co.

Windsor Company Incorporated—The Windsor Motor Car Co. has filed a certificate of incorporation in the county clerk's office in Buffalo, N. Y. The capital stock of the concern is $10,000. The directors are Henry M. Colgrove, Joseph Schmidt, Jr., and Joseph J. Buettner.

Maxwell Sleighmobile—Lang & Scharman, agents for the Maxwell at Marshfield, Wis., have produced a sleighmobile by remodeling a Maxwell runabout into a sleigh. The front wheels have been removed and replaced with runners, while heavy anti-skid chains have been attached to the rear tires of the machine.

Moore Also Has National—Harry S. Moore, who for a number of years has been handling the Stoddard-Dayton in Cleveland and northeastern Ohio, has added the National to his line. Mr. Moore is opening a large downtown branch as main salesroom and offices at 2034-36 Euclid avenue.

Becker Divides His Fortune—H. V. Becker, of Clyde, O., who with his two sons sold the Elmore plant a short time ago to the General Motors Co., last week divided $200,000 among his children and other relatives. He announces that he believes children should enjoy the money while they are young. Some years ago he made a similar division of property.

Stromberg Closes Coast Branch—The San Francisco office of the Stromberg company has been discontinued and the Pacific coast agency placed with the Chanslor & Lyon Motor Supply Co., which has offices at Los Angeles, San Francisco and Seattle. W. R. Johnston, who was in charge of the San Francisco branch, will return to Chi-

cago. Thomas Hart, formerly assistant manager, will remain on the Pacific coast to look after the interests of the Stromberg Motor Devices Co.

Green Bay Man Retiring—J. C. Zimmerman, of the Green Bay Motor Car Co., of Green Bay, Wis., has sold his interest to W. H. St. John, of Oshkosh, Wis., and will retire.

Should Have Been $15—In last week's issue of Motor Age a typographical error appeared in the advertisement of the Star Speedometer Co., in which the price of this apparatus appeared as $51 instead of $15.

Branch in Detroit—Owing to the largely increased business of the Billings & Spencer Co. in the middle west, Claire L. Barnes, general sales manager of the company, will establish offices in Detroit, in the near future. Mr. Barnes will divide his time between Detroit and the factory offices at Hartford, Conn.

Mitchell Building Testing Track—The Mitchell-Lewis Motor Co., of Racine, Wis., the $10,000,000 corporation resulting from the amalgamation of the Mitchell Motor Car Co., Mitchell & Lewis Wagon Co. and allied interests, has started work on the construction of a ½-mile track for testing purposes. In the center of the oblong space will be a grade testing device, ranging from 1 to 75 degrees.

Reo Business—If placed 5 feet apart the proposed output of Reo cars for 1910 would form a line extending from Lansing to Jackson. The plans for the year call for the manufacture of 10,000 cars and the volume of business will reach the $12,000,000 mark. In 1909 there were 7,000 cars completed and the plant did business amounting to a value of $6,500,000. The foreign business of the company increased greatly over previous years and the prospects for increase in 1910 are exceedingly bright at the present time.

Appointed in Galveston—J. Christansen & Co. have been appointed agents in Galveston, Tex., for the Cole. They also have been appointed agents for the Baker electric.

Will Make Trucks—Joerns Brothers, of Stevens Point, Wis., has organized a corporation with headquarters in St. Paul to manufacture motor cars and trucks. C. A. Joerns, of Sheboygan, will be general manager. The Joerns shops at St. Paul will be overhauled and remodeled for the purpose at once.

Carrying the Corbin—A. L. White and Raymond Ware have formed a company in Boston and have taken the agency for the Corbin car which was represented in Boston for a long time until last season, when it was dropped. The new firm has opened salesrooms at 1024 Boylston street.

Another Flint Enterprise—The Auto Top Mfg. Co., of Flint, Mich., has been organized with a capital of $10,000 and will construct a factory of its own during the coming summer. M. L. Dyer is president, S. D. Bolton is vice-president, C. A. Fox is secretary and treasurer and A. W. Myers is factory superintendent. The concern will manufacture tops for motor cars and launches.

New Love Garage—The Love Garage Co., of Columbus, O., has moved into its new building at the corner of High street and sixth avenue. The structure is especially designed for a sales agency and garage, and has a floor area of 15,000 square feet on its two floors. It has a frontage of 51 feet and a depth of 150 feet. Every appliance of an up-to-date garage and repair shop has been installed, including a turntable, charging plant for electrics and complete shop. The turntable is sufficiently large for a car having a 144-inch wheelbase. The garage has two entrances.

Opens Garage in Pittsburg—The Park Automobile Co. has secured the Pittsburg agency for the Ohio 40. The members of the company are J. C. Armor, A. G. C. Quay and H. G. Knapp, and its fireproof garage at 210-210 West Ohio street, north side, will hold forty cars.

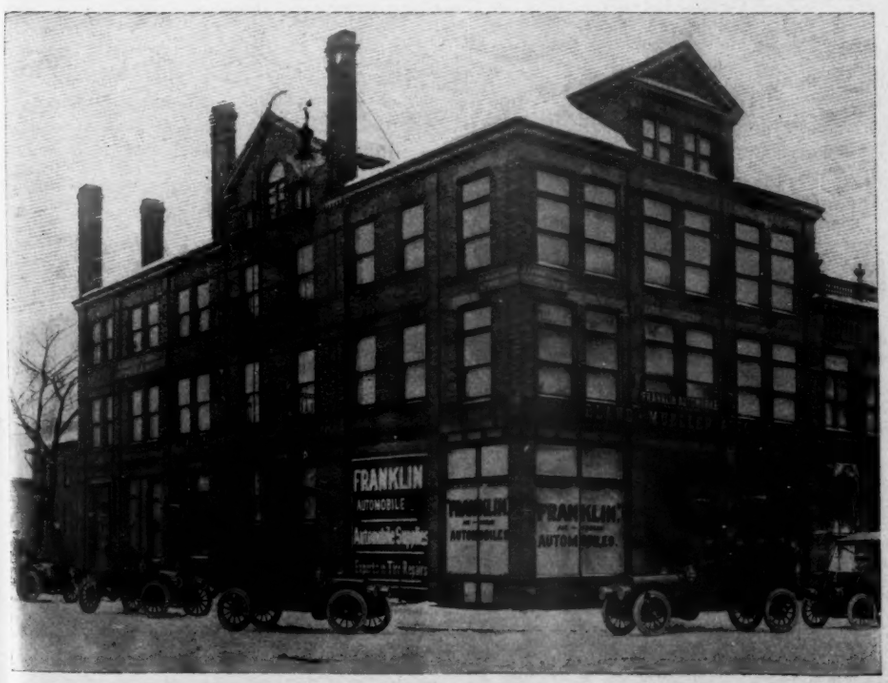
Hub Store Spreads Out—The Mitchell business in Boston has increased so much that W. M. Jenkins & Co., who have the eastern New England territory, have had to lease the store adjoining their present location giving twice as much room. The two stores will be turned into one, making it one of the best salesrooms on Columbus avenue.

Starts Taxicab Service—The Excelsior Express and Standard Cab Co., which has for a quarter of a century been the leading cab and express company in Pittsburg, will add a taxicab service to its business February 1. The company's offices are located at 1127-1133 Liberty avenue. It has purchased, as a starter, twenty taxicabs from the Atlas Motor Car Co., of Springfield, Mass.

Making New Type of Motor—The Holbrook-Armstrong Mfg. Co., of Racine, Wis., is perfecting a new type of four-cylinder motor which it is reported on reliable authority will be used exclusively by the Racine-Sattley Co. for the production of gasoline cars and trucks. The Holbrook-Armstrong company is said to have contracts for deliveries of its motor to the Sattley concern beginning in 30 days.

Chicago Changes—John T. Fisher, formerly Mercedes representative in Chicago and later manager of the Indian motor cycle branch in the Windy City, has been appointed manager of the Chicago branch of the Babcock electric. The McIntyre car has secured a Chicago representative in the Security Automobile Co., at South Park avenue and Thirty-third street. The Speedwell company has taken on the Staver-Chicago in addition to the Speedwell, while the Paul Picard Co. has opened the R. A. C. agency at 1339 Michigan avenue, along with the Nadall demountable rim makers.

Simplex Rumor Denied—Some time ago there was a persistent rumor circulated both in South Bend and Mishawaka, Ind., that the Buick company was negotiating for the purchase of the American Simplex Motor Car Co., of Mishawaka. Evidently the report was unfounded from the unequivocal denial made by D. A. Shaw, treasurer of the Simplex company. The following statement was made by Mr. Shaw relative to the rumor: "There is no such deal on at the present time. Some time ago the Buick tried to absorb the Simplex, but it failed to do so, and there is no new deal on with that object in view at the present time."



BLAND-MUELLER AUTO CO., A PROMINENT MILWAUKEE CONCERN

Brief Business Announcements

St. Louis, Mo.—The H. H. Franklin Mfg. Co., of Syracuse, N. Y., has established an agency in this city.

Dover, Del.—The American Engine and Motor Co., of this city, has been incorporated with a capital stock of $1,000,000.

Louisville, Ky.—The Strawffer-Arterburn Motorcar Co., of this city, has been incorporated with a capital stock of $4,000.

Hornell, N. Y.—Creditors of the Hornell Auto School garage, of this town, have filed a petition in bankruptcy against the concern.

New Hayen, Conn.—Plans are being prepared for a garage to be built by E. W. Squirex, at Whalley avenue and Orchard street.

Oakland, Cal.—C. H. Davis has been appointed agent in this city for the Cartercar and is shortly to establish headquarters in Twelfth street.

Seneca, Kan.—William E. Kennard has taken over the garage formerly conducted by Thomas Bennett & Son and will conduct the business in the future.

Chicago—The C. P. Kimball Co. has bought property on Michigan avenue, near Thirty-ninth street, and is to erect a new building to be devoted to the motor car department of the firm's business.

Pittsburg, Pa.—The Ohio is to be handled in this city by the Park Automobile Co., 210 West Ohio street, Northside. This company was recently reorganized by J. C. Armour, H. G. Knapp and A. G. C. Quay.

Denver, Colo.—The Krebs-Covington Automobile Co. has secured the agency for the E-M-F and the Flanders, and the company has removed to 1532 Broadway, the former location of the Studebaker company. In addition to the two new lines, the Krebs-Covington company has the Haynes and Detroit electric agencies.

Lansing, Mich.—The Reynolds Motor Car Co., of Detroit, has been incorporated with a capital stock of $40,000. The Standard Auto Accessory Co., of Detroit, has been incorporated with a capital stock of $40,000. Another new concern is the Detroit Electric Vehicle Co., also of Detroit, which has a capital stock of $5,000.

New Haven, Conn.—The Belmont Motor Car Co., which has just filed articles of incorporation with the secretary of state with a capital stock of $100,000, already has located a plant on State street, near Lawrence. It is to take over the business of the old Belmont Motor Car Co., of New York, a corporation of which Dr. Baxter C. Tiley was president. Dr. Tiley is named as one of the incorporators of the new concern, together with William J. Smith and F. B. Frisbie, of this city. The officers of the new company have not yet been elected.

Granville, N. Y.—C. I. Mosher and H. J. Penn have opened a garage at Dr. Mosher's residence.

Utica, N. Y.—D. D. Bender has secured the agencies in this city and vicinity for the Hupmobile, Rider-Lewis and the Koehler.

Hartford, Conn.—Articles of incorporation have been filed by the Belmont Motor Car Co., of New Haven, with a capital stock of $100,000.

Richmond, Va.—Graham P. Weisiger has assumed the management of the Alexander-Seewald Co., which has the agency in this city for the Franklin.

Philadelphia, Pa.—Application is to be made for a charter for the Lyman Tire and Rubber Co., which is to manufacture and deal in tires and appliances.

New York City, N. Y.—Flandrau & Co., a carriage concern of Broome street, have taken over the exclusive selling agency in the United States for the Brasier.

Wilkes-Barre, Pa.—In the future the Sheldon Axle Co., of this city, is to manufacture motor cars. Application has been made for permission to issue bonds to the amount of $200,000.

Philadelphia, Pa.—George O. Simpson, who has been connected with the Goodrich Rubber Tire Co., of 1332 Arch street, for a number of years, has been appointed manager of the local branch.

Detroit, Mich.—The Lotz Auto Co., which recently was incorporated with a capital stock of $30,000, is planning to erect a new plant in this city. Among those interested in the new project are J. A. Lotz, George Christianson, George Cooley and others. The company in addition to making three types of cars, is to manufacture a new rubber tire, the invention of George Cooley, of Grand Rapids. Property for the new plant has been secured on Harper avenue.

RECENT INCORPORATIONS

Troy, N. Y.—Troy Garage Co., capital stock $20,000; incorporators, Roy R. Rhodes, P. H. Russell and A. E. Mambet.

New York—Imperial Auto Horn Mfg. Co., capital stock $10,000; incorporators, P. Martino, H. B. Rosenson, G. Bray and A. Gerardi.

Jersey City—Julius Scholl Co., capital stock $25,000, to deal in road machinery, motor cars, etc.; incorporators, J. C. Tucker, Jr., Edward Claxton and J. Warren.

Jersey City, N. J.—Ellis-Tonnele Co., capital stock $50,000, to deal in motor car supplies, parts, etc.; incorporators, A. L. Ellis, L. J. Tonnele and L. E. Herrman.

Cape Girardeau, Mo.—A. J. Vogel Co., capital stock $2,000; incorporators, A. J. and E. W. Vogel and W. D. Black.

Topeka, Kan.—C. F. Frith and Charles G. Short, formerly of Wamego, are to go into the garage business in this city.

Dover, Del.—The Auto Storage Co., of Wilmington, has been incorporated with a capital stock of $30,000, by H. E. Seibert and H. O. Keener, of Philadelphia.

Cincinnati, O.—The Franklin Automobile Co., under which name the H. H. Franklin Mfg. Co., of Syracuse, maintains its branches, has opened an agency in this city.

Binghamton, N. Y.—A permit has been granted to Howard Brown, of the Binghamton Motor Car Co., for the erection of a garage at 195-199 State street, at a cost of $20,000.

New York—Marcus Allen has severed his connection with the Empire Tire Co., of which he has been manager, and in the future will be sales manager for the Dorian rim.

New Orleans, La.—George E. Demack, who has been connected with the Revol Co., is planning to go into business on his own account. Work is to commence shortly on the erection of a garage and repair establishment.

Philadelphia, Pa.—Application will shortly be made for a charter for a company to be known as the Lymann Tire and Rubber Co., which is to manufacture and deal in mechanical and commercial rubber goods and appliances of all kinds.

Minneapolis, Minn.—A charter has been granted to the Heaney Automobile Co., which is to make and deal in accessories and supplies. The company is to have a capital stock of $50,000 and is to make its headquarters in this city.

Trenton, N. J.—The American Simplex Co. of New Jersey, of Newark, has been incorporated with a capital stock of $7,500, to engage in the manufacture of machinery, tools, hardware, mechanical appliances, motor cars, motor vehicles, etc. The incorporators are C. B. Craske, J. A. Bolles and A. W. Meisel.

Windsor, Ont.—The Dominion Motors Co., Ltd., has been incorporated and will manufacture a car to be known as the Royal Windsor. A site for a plant is now being sought, and work will be commenced as soon as possible, it being desired to start deliveries of the cars by June next. Temporary offices have been opened at 24 West Pitt street, and A. J. Kinnucan and Earl W. Winans have been appointed secretary and engineer of the new company.